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August 28, 1950

STEEL

The Magazine of Metalworking and Metalproducing

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"Tubing?...Yes, I know where we can get it

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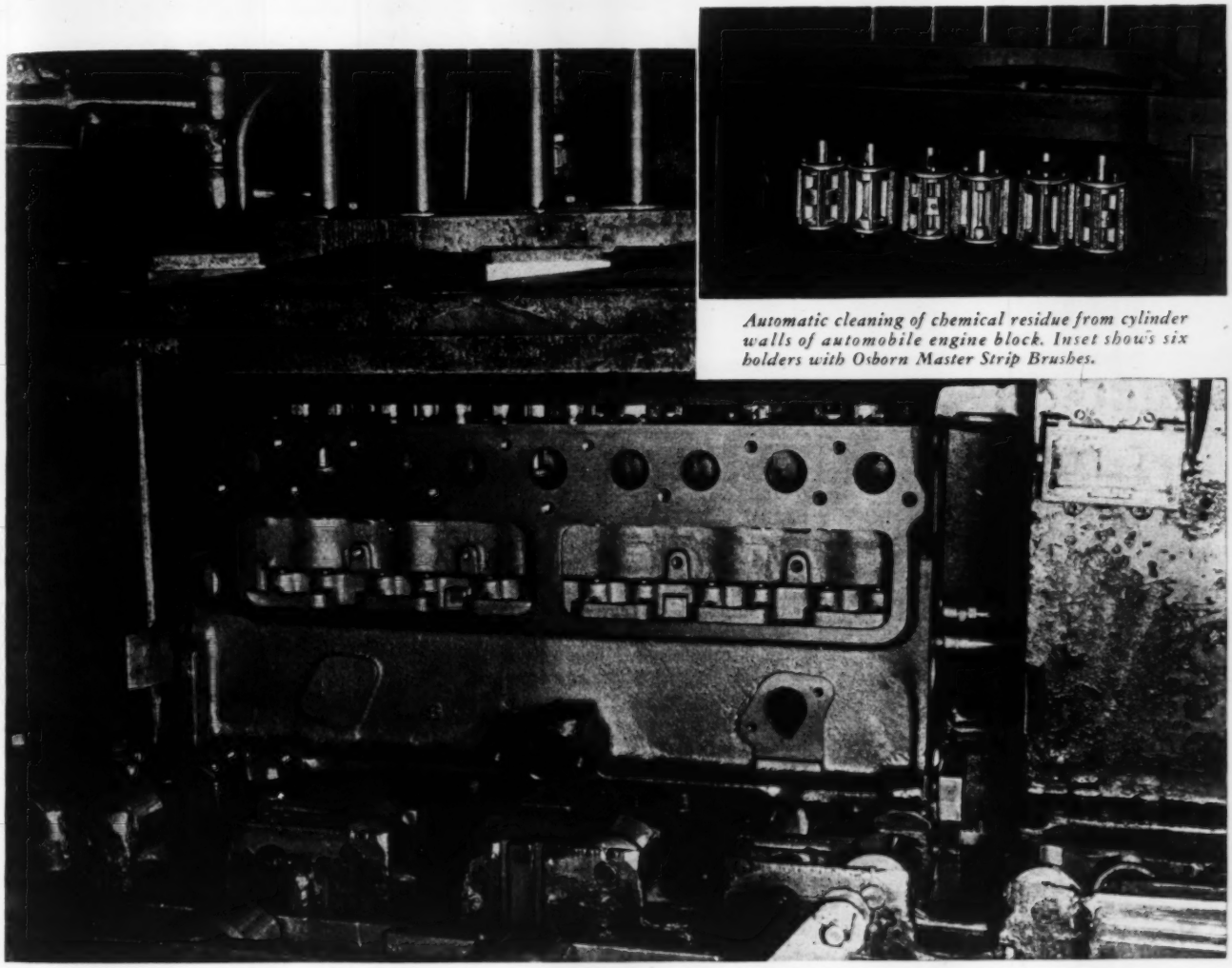

Automatic cleaning of chemical residue from cylinder walls of automobile engine block. Inset shows six holders with Osborn Master Strip Brushes.

Inside Story: How Osborn brushing adds miles to motorblocks

WITHIN the walls of each engine block are many secrets of modern motor car performance. Of these, surface finish plays a major role for extending operating efficiency . . . for prolonging engine life.

When it comes to cutting wear and corrosion, complete freedom from metallic burrs and residue is all important. To achieve this result at low cost, a leading car manufacturer is automatically brushing away burrs, chemical residue and other foreign matter from cylinder walls after a special metal treatment to increase wear resisting qualities.

Osborn Master® Strip Brushes are mounted on each of 6 holders of the multiple head vertical boring machine, shown above. After loading the engine block, the machine cycle is started and all 6 cylinder walls are cleaned simultaneously...in only 30 seconds.

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"All Motors are NOT Alike"

Behind the Scenes...

The Echo Is Bad

That echo you hear is from a ten-year-old issue of STEEL, Aug. 26, 1940. We've been thumbing through back copies.

In STEEL a decade ago this week were stories discussing the plant capacity for defense production and a proposed excess profits tax. Executives were beginning to be loaned by industry to the government. The Aug. 26 issue carried a list of Army-Navy contracts for the week and told how the Walsh-Healey Act affected wage determinations in companies working on government contracts. A report was given on the proposed $20 million tank plant for Chrysler.

Pick up this issue of STEEL, Aug. 28, scan a few issues for the past three or four weeks and you'll see the same kind of stories that appeared only ten years ago.

Unfortunately, the printers have not gone haywire. They aren't using ten-year-old type by mistake.

Glass Owl Eyes

If you need any glass owl eyes for owl andirons, we've located the man who can supply them to you. He's H. A. Schumacher of 285 Halladay St., Jersey City, N. J. Mr. Schumacher makes glass eyes and taxidermist supplies. He's also a glass blower and has been in business 58 years.

Mr. Schumacher kindly dropped us a note telling us of his services. We'll keep him in mind.

Want To Be President?

What's your chance of being a company president some day? A survey by American Institute of Management indicates that in 204 leading companies 25 per cent of the presidents never attended college; 12.3 per cent attended Yale; 8.8 per cent Harvard. Other colleges that produced company presidents—but far fewer than Yale or Harvard—include Cornell, Columbia, Princeton, University of California, M.I.T., Wisconsin, N.Y.U., Penn State, Minnesota and Purdue.

Eighty company presidents came from Midwestern states; 69 from middle Atlantic States; 8 from foreign countries. None of the companies queried had presidents under 40; 77 per cent of the presidents were between 50 and 70; 15.7 per cent were under 50. The average age was 58. Of the 12 highest salaries received by the presidents of companies canvassed, three went to chemical executives, two to automobile heads, one to a steel chief, one to an electrical product president. Executives of a food store chain, a mail order house, a soap company, a textile firm and a low priced variety store were also among the highest paid. Of the 12 highest salaries, all were over $225,000 a year.

Missouri Mule

Our friend, Geraldine, cleaning woman in the building and our night editor, has just returned from a long vacation in Missouri. Hence, her lengthy silence. She came back loaded with copy, including the intelligence that the Greek Committee for the Procurement of Mules needs 6000 of the creatures. Missouri is all agog over the news.

Puzzle Corner

We've wrung out our brains on the pasturage problem of Aug. 14 and have decided that the answer that came in our little black book was wrong and that the ingenious M. S. Bailey, Machine Products Corp., came up with the correct solution. The rope tying the cow, he says, was 57.91 feet long. The answer in our puzzle book was 35.36 feet, which we think is incorrect.

Cool off with this one: A river 10 miles wide flows due south at the rate of 5 miles per hour. A man on the west bank wishes to reach a point on the east bank 2 miles farther south in the shortest possible time. He starts out in a motor boat that can do 15 mph in still water, but he runs out of gas when he reaches midstream. He abandons ship and swims the remainder of the trip. If he can swim 3 mph in still water, in what direction should he have started?

Shrdlu

(Editorial Index—page 35)

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STEEL

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Next Week ... **Precision Hardening in Twin Batch-Type Carbonitriding Furnaces ... New Thread Form Reduces Bolt Breakage ... Drawing Characteristics of Stainless Steels ... How To Choose Blast Furnace Refractories—I**

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dimensions
from
WAREHOUSE STOCKS

Although over-all warehouse stocks are still substantial, sheet and strip steel inventories were out of kilter even before the Korean war broke out. Heavy demand had already reduced tonnages in the more popular items.

Only now it will be all the harder to rebuild these stocks. The men who run your steel warehouses know that. But as a body they have a deep sense of customer-responsibility. You can count on their all-out effort to continue to make steel available to you—to help keep your production going.

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August 28, 1950

More Harm Than Good

A small manufacturer of a product which is 95 per cent rolled steel has written us about his problem. Several years ago, because he had no prewar pattern of steel purchases, he could not obtain steel from mills. He bought high-priced steel but in competition with manufacturers buying steel at normal prices, he lost customers and money.

Last year, when steel was more plentiful, he received substantial shipments from two mills and enjoyed a spell of profitable business. Now that steel supply is short again, the two mills refuse to accept his orders. His business is falling off and he is losing money.

He writes: "Do you think we regret having the government go into the steel business? On the contrary we continually beseech them to do so. I believe you or anyone else in our position would do the same. . . . Unless the steel mills work out a fair allocation system so that small legitimate firms like ours can get a reasonable portion of their required tonnage, the steel mills are going to put the government in the steel business."

Every now and then, a harassed steel producer throws up his hands and privately says something like this: "Why do I break my neck trying to parcel out steel fairly to those who want it? If the government were to allocate my steel, it would relieve me of a terrific headache."

Last Wednesday railroad trainmen and conductors unions ordered a nationwide strike to begin Monday morning, Aug. 28. Nobody tried to conceal the fact that the strike-call was a move to force the President to seize the roads.

In all three cases, the injured parties assume that their problems would be solved if they were turned over to the government. The assumption is correct. The manufacturer would get his steel, the producer would be relieved of a difficult task and the railroad men would get increased wages—but at what an exorbitant price! In each case a present temporary difficulty would be exchanged for permanent, more complex difficulties of greater magnitude.

Persons really injured by today's confused state of affairs deserve help, but turning over everything to Uncle Sam would do them more harm than good.

* * *

DEFINES SMALL PLANT: Small Business Division of the Department of Commerce is attempting to find a practical answer to the question "What is small business?" After studying the 452 industries reported in the Census of Manufactures, it concluded that the number of employees identifying a business as small varies greatly among industries. Therefore it has worked out a preliminary tabulation showing the maximum number of employees a plant can have and still be recognized as a small establishment.

According to the tabulation, if you are operating steelworks and rolling mills and your employees do not exceed 2500, yours is a small plant. Your machine tool building plant is small if it employs not more than 400. If you manufacture cutting tools, jigs and fixtures, your plant is small if the number of employees does not exceed 100. The dividing line between large and small establishments is 250 employees for steel forge shops and 175 for gray iron foundries.

These figures are subject to revision, but if formal allocation controls become necessary, ef-

(OVER)

forts may be made to use such figures to determine how raw materials shall be distributed. For instance, if in a given industry establishments employing 100 or fewer workers do one-third of the business of the entire industry, then they would be entitled to one-third of the materials available to that industry.

Adaptation of this system to the exigencies of emergency production probably would encounter numerous unforeseen difficulties. —p. 53

* * *

WASTING MANPOWER: Increasing opposition is being registered against arbitrary age limits set in many of the pension plans adopted in recent months. At a Conference on Aging, held in Washington, speakers estimated that enforced retirement, together with the loss of energy that overtakes a man when he realizes he soon will be tossed on the scrap heap, constitutes a loss of 7 or 8 per cent in the nation's effective manpower.

The desirability of continuing able-bodied persons beyond age 65 is obvious, but there is another factor which has received too little attention. Whereas we are adopting pension plans to make it easier from a financial standpoint for workers to retire at an arbitrary age, we are doing practically nothing to prepare them for the shock of retirement. If more people could develop outside constructive interests to engage their mental and physical skills after retirement, much of the horror of quitting at 65 would be avoided. —p. 44

* * *

5-YEAR DEPRECIATION: Senate Finance Committee has adopted a provision for rapid depreciation of war plants and equipment in its interim defense tax bill. It would permit taxpayers to write off for tax purposes the cost of war production facilities at 20 per cent a year for a five-year period beginning in 1950. This privilege of accelerating depreciation would be extended only to companies certified by the government. Companies believing they are entitled to this preferential treatment would have to apply for it; the government would not take the initiative in proffering it.

Chances that Congress and the administration will accept this plan are said to be fairly good. It differs from the World War II law in that it provides for no variation from the five-year amortization. The former law provided for amortization in fewer than five years if the President terminated the emergency during the five-year period. —p. 47

* * *

COLD VS. HOT-ROLLED: For many years the laminations constituting the magnetic cores of electric motors and dynamos have been punched from hot-rolled silicon steel sheets. In recent years, there has been a noticeable trend toward a substitution of cold-rolled sheets for the hot-rolled product.

Extensive research indicates that the shift of materials can be made without sacrificing any of the qualities desired in the finished motor or dynamo. It also provides evidence that the cold-reduced sheet has some attributes that can be used to advantage by the manufacturers of rotating electrical machinery.

One is "punchability." More laminations per die grind can be punched from cold-rolled than from hot-rolled sheets. Surface oxides on cold-reduced material are thinner and slightly more insulating than those present on the hot-rolled product. This gives the electrical equipment manufacturer a greater amount of steel in a given height of stacked laminations—a favorable property known as the lamination or space factor. —p. 72

* * *

FEAST AND FAMINE: If you are looking for a good illustration of the feast-and-famine phenomenon in business, consider recent conditions in the machine tool industry. In July, 1949, the index of new orders compiled by the National Machine Tool Builders' Association (1945-1947 = 100) stood at 48.0. In July, 1950, it stood at 253.3. The July, 1950, index is a seven-year high; the July, 1949, index is a post-war low.

The volume of new orders obviously is welcomed by machine tool builders, but from the standpoint of national defense it is somewhat disconcerting. World War II demonstrated that our machine tool industry is exceedingly flexible, but now we have the industry so heavily loaded that any expansion of war needs beyond the direct requirements of the Korean situation would impose a terrific burden. Judging from past experience, the industry will come through with whatever is demanded. —pp. 60, 75

E. C. Shaner

EDITOR-IN-CHIEF

News Summary

THEY WANT MORE MONEY— Brace yourself for another round of labor demands for wage increases that will be especially severe this time because union chiefs are afraid pay controls will be slapped on after the November elections (p. 43). Two railroad unions are leading the parade for more money, and some UAW locals are restive, particularly at Packard and International Harvester. The UAW has big ideas; it plans to build a $25 million strike fund. It has served notice on Ford that it will strike next Jan. 2 if pay increases don't come. The steelworkers can open negotiations for more money Nov. 1.

THINGS TO COME—Follow closely the Cadillac tank assembly operation in Cleveland because from it will evolve a subcontracting pattern that will be applied with only minor modifications on other government defense jobs (p. 45). Cadillac will assemble the finished tank. The GM division itself will build the hull and turret, one of the four major elements in a tank, and is contracting for or already has let awards for the power plant and transmission, another principal part of the vehicle. The Watervliet, N. Y., arsenal will subcontract for armament, the third element. Frankford, Pa., arsenal will subcontract for the central fire control system, the fourth principal element.

STEEL FOR WAR—If World War III comes, how much steel will be required? It's likely that an allout war would take more steel than did World War II. Steel shipments for direct war uses in that conflict reached a maximum of 22.8 million tons in 1943, or 38 per cent of total shipments that year (p. 46).

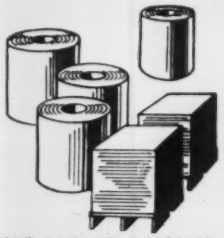
HAND MILLS COME BACK—The shortage of steel sheets is postponing the obsolescence of the old hand sheet mills (p. 46). Getting a chance for a new lease on life are hand facilities at Portsmouth and Toronto, O., Apollo and New Castle, Pa., and Indianapolis.

AMORTIZATION AGAIN—If you can get the government to agree that you have purchased new plant and equipment for defense work, you can write the facilities off in five years should a Senate Finance Committee proposal get adopted (p. 47). The amortization scheme is similar to the World War II plan liberalizing depreciation. Many companies didn't like it then because it was no permanent program and because too much red tape was involved in getting government certification.

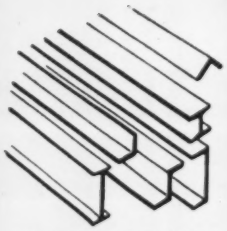
CALL FOR INVENTORS—Got any good inventions brewing in your basement? The National Inventors Council, a government-sponsored group headed by GM's Charles F. Kettering, is looking for ideas on new or improved weapons or gadgets to aid the defense efforts (p. 50). Can you help the council devise: A means to get the Voice of America through the jamming of radio channels behind the Iron Curtain; lightweight equipment to translate speech into writing; a way to compact snow to support military vehicles?

SCARCITIES MOUNT—The worst of the scare buying is over, but shortages of metalworking raw materials and components increase (pp. 60-63). Scarcities are keeping the auto assembly rate at around 192,000, a good pace but below the June peaks. Deliveries on electric motors are getting more and more extended. Tieups because of the railroad strike make steel tighter than ever . . . Gross national product in the second quarter was at an annual rate of $269.9 billion, the highest on record.

HERE AND THERE IN INDUSTRY—Allocations chief under the Defense Production Act of 1950 probably will be Maj. Gen. William Henry Harrison (p. 46) . . . GM is boosting its cost-of-living allowance to employees to compensate for the rise in the cost of living since April 15 (p. 44) . . Lukens Steel Co. and Worth Steel Co. have sold their stock interest in Brooke Iron Co. (p. 48) . . . Vulcan Mold & Iron Co. will build a $1 million plant near Chicago (p. 49) . . . Bethlehem Steel Co. is exploring manganese ore deposits in Brazil (p. 55).



HOT AND COLD ROLLED SHEETS AND STRIP



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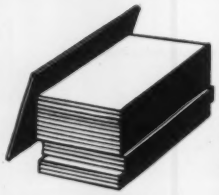

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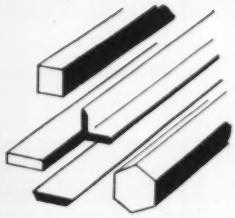
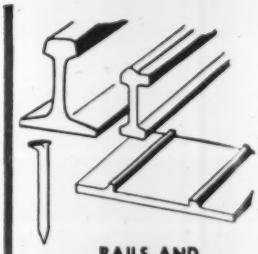
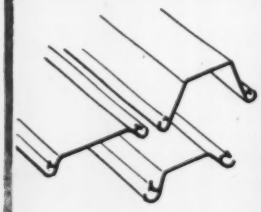


CARBON STEEL BARS

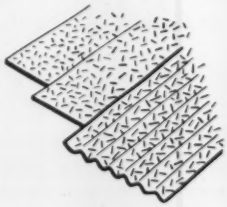


RAILS AND TRACK ACCESSORIES

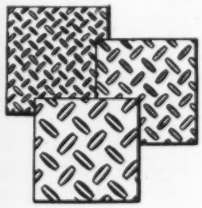
HI-BOND* REINFORCING BARS



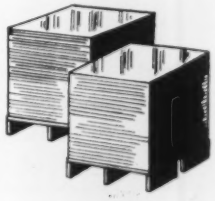
SHEET PILING



GALVANIZED SHEET PRODUCTS



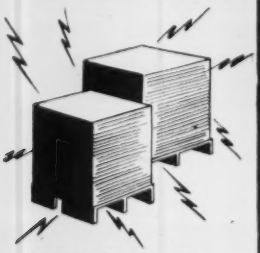
4-WAY* SAFETY PLATE



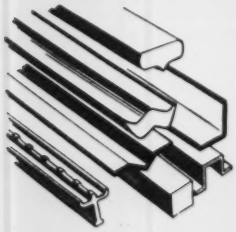
TIN MILL PRODUCTS

ENAMELING IRON AND TI-NAMEL* SHEETS

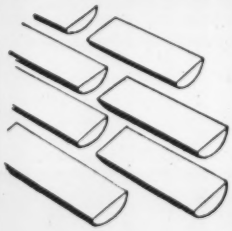
you can rely on **INLAND** for the **RIGHT STEEL**



ELECTRICAL SHEETS

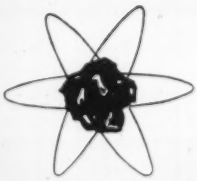


RAIL STEEL PRODUCTS

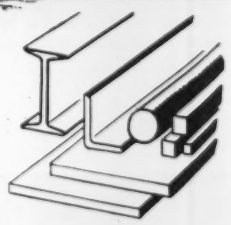


PIG IRON

LIMESTONE



COKE BY-PRODUCTS



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the men and mills of INLAND STEEL COMPANY are geared to serve the industrial heartland

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STEEL
A PENTON PUBLICATION

Labor Gets Set for Wage Round

Railroad unions lead the parade in a drive for more money before controls come in. Steelworkers can open talks Nov. 1. UAW plans a $25 million strike fund

THAT RUMBLE you hear is from labor guns loosening up to support higher wages. The barrage may be fiercest in late October or early November just before the next elections.

The Way Their Minds Work—Union chiefs reason this way: Wage and price control powers in the Defense Act of 1950—soon to be in shape after House-Senate conferences—may not be exercised at all by the politically minded administration, but if they are, they'll become effective after a decent interval of perhaps two months following the Nov. 7 elections. To be on the safe side, unions figure they should try for more money soon.

Two railroad operating unions' threat of a nationwide strike was an obvious attempt to get a wage hike through government seizure of the roads. Some 8000 union members at Packard were out last week. Ford Local 600 of the UAW informed the company that it will call a strike Jan. 2, 1951, unless wage increases come before then. The unorthodox maneuver of calling its shot so far in advance was taken by the Ford union to try to pressure a wage boost before wage controls come.

Moving Up: Heavy Stuff—Those are some of the opening battles. More artillery is coming. The executive board and wage policy committee of the United Steelworkers-CIO will meet in Pittsburgh in October to decide on the wage policy. The present steel contract provides for a reopening on wages alone, Nov. 1. The union is contractually free to strike after Dec. 31, 1951.

Another piece of heavy artillery is being fashioned in the form of a $25 million strike fund for the United Auto Workers-CIO. The UAW hasn't yet finally decided on how to raise that money, but it will probably get part of it by boosting dues from $1.50 to $2.50 a month. The UAW now has assets of about $5.2 million and more than 1 million dues-paying members.

What the Guns Can Do—The effect of the "token" rail strike on defense production was seen last week when picketing members of the Brotherhood of Railroad Trainmen and Order of Railway Conductors snarled metalworking activity, particularly at steel facilities, in Cleveland, Youngstown, Pittsburgh, Chicago and other cities. U.S. Steel's Carnegie-Illinois Steel Corp. had to close down some of its plants in the cities affected, as did Republic Steel Corp. and Youngstown Sheet & Tube Co.

Besides being able to curtail defense output, labor can call on still another weapon in its fight for higher wages. Unemployment is down to 3.2 million, practically the irreducible minimum. Virtually nobody is available to step into a striker's job even if he dared cross the picket line.

Harvester Hikes Salaries

International Harvester Co. is giving a general wage increase for all non-managerial salaried employees not represented by labor unions in its sales and manufacturing operations and at its general office in Chicago.

The boost provides a 3 per cent increase over present earnings, plus an additional three cents an hour cost-of-living increase based on the Bureau of Labor Statistics cost-of-living index. The increase affects about 18,000 Harvester non-managerial salaried employees and was effective Aug. 15. The company is giving commensurate increases for managerial employees in some categories.

The company recently made wage proposals to unions representing production and maintenance employees and salaried employees in its manufacturing operations. After a short strike, some 5000 members of the Farm Equipment Workers Council, United Electrical Workers (Ind.) at Harvester's tractor works in Chicago accepted a 4-cent-an-hour increase plus a 3 per cent cost-of-living boost. The contract may be reopened in December and every six months thereafter for further wage negotiations. The company's offer to the UAW-CIO representing 22,000 workers would tie wages to the Bureau of Labor Statistics cost-of-living index while granting a 4-cent hourly increase. The UAW refused the offer and struck.

The increase granted salaried employees, plus the offer made the various unions, would cost Harvester about $16 million annually. A pension and welfare plan put into effect a few months ago will cost another $13.5 million yearly.

Allis-Chalmers Signs for Pension

Allis-Chalmers Mfg. Co., Milwaukee, signed contracts with Bankers Life Co., Des Moines, Iowa, to insure pensions for 29,900 employees.

The contracts become effective Sept. 1. They're of the deposit administration type whereby annuities are purchased from an insurance company out of funds deposited with the insurance company by the em-

NEA

JAM AT CADILLAC TANK PLANT: MOBILIZATION DRAINS LABOR POOL
. . . higher employment will help unions win wage boosts

ployer. Allis-Chalmers employees 65 and over and with 25 years or more of service will get $100 a month, including federal social security. Reduced amounts are also payable for retirement after 60 with 10 or more years of service.

Old Age Creeps Up

Growing opposition to the arbitrary age limits and certain other features of the pension plans that increasingly are being agreed upon between employers and unions in private industry was reflected at the Conference on Aging, held in Washington recently. Two undesirable repercussions are assuming dangerous proportions, speakers at the conference declared.

One is the tendency of retirement schemes to reduce the mobility of labor, to make it inexpedient for a man to shift from one employer to another, because a change would mean loss of his pension rights .The other lies in the damping down of energy and initiative in men approaching the age of compulsory retirement.

Enforced retirement, together with the loss of energy that overtakes a man when he realizes he soon will be tossed on the scrap-heap, it was estimated by conference speakers, constitute a loss of 7 or 8 per cent in the nation's effective manpower. A quarter-century ago, we might have held that our economy was sufficiently strong to carry such a handicap, says Alvin Johnson, director of the New School for Social Research. But not today. "Today," he says, "our economy is in competition with another, founded on principles abhorrent to us. In the long run the security of our system of life depends upon our superior productive power."

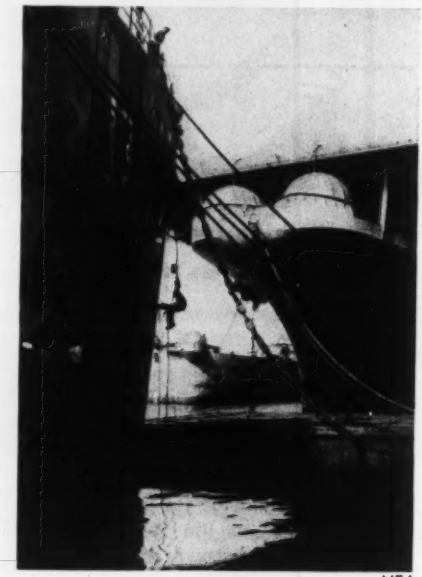
The problem becomes all the more important because of the lengthening span of human life; predictions were heard that we are headed eventually to a normal life-span of 125 years. The conference was told that whereas 7.6 per cent of our people now are past 65, the conventional age of retirement, this group will constitute 10 per cent or more in another 25 years. There was wide agreement on the concept that able-bodied workers, no matter what their age, should be permitted to continue as productive units until death, particularly at a time like the present when the nation needs their services.

Leftist Union Loses

Most of Felt & Tarrant Mfg. Co.'s 500 production and maintenance workers gave the Farm Equipment Workers' union the heave-ho as their bargaining agent last week. National Labor Relations Board will hold an election Sept. 5 to decide whether the men will be represented by the CIO International Union of Electrical Workers or by no union. The FE will not appear on the ballot.

In substituting the IUE-CIO for the FE, Harry E. Manola, former FE local president but now IUE local president, declared that the present contract with FE would remain intact. This contract, incidentally, contains an anti-communist clause permitting the company to fire Red sympathizers.

About 35 toolroom workers, also former FE members, turned their backs on that union and will decide on Sept. 5 whether they will be represented by the International Association of Machinists (Ind.) or the IUE.



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ALIAS LSD 13: The U.S.S. Casa Grande gets a going over by its crew members. Known also as LSD 13, it is the first Navy vessel to be taken out of mothballs at Bayonne, N.J. In the background is the aircraft carrier, Tarawa. The 457-foot Casa Grande is one of the Landing Ship-Docks that served as landing craft mother ships. Its displacement is 9375 tons. Her big dock can be flooded by letting water into her ballast tanks so landing craft can leave under their own power through the stern gates

GM Boosts Allowances

General Motors Corp. is boosting its cost-of-living allowance to about 411,000 hourly rated and salaried employees to compensate for the rise in the cost of living since Apr. 15.

Under the GM wage adjustment formula, about 335,000 hourly employees will receive an additional 5 cents per hour as a cost-of-living allowance effective with the first pay period beginning after Sept. 1. They have been receiving a 3-cent hourly cost-of-living allowance during the current quarterly period.

About 76,000 GM salaried employees will receive an additional $25 or a total of $40 as a cost-of-living allowance for the period between Sept. 1 and Dec. 1. That allowance will be paid in December.

Four wage and salary adjustments —one increase and three decreases— have occurred in the cost-of-living allowance paid GM employees since the formula was adopted in May, 1948.

Big War No Deferment Assurance

Should the Korean war be supplanted by a more severe war emergency, the government's lists of critical occupations and essential industries (STEEL, Aug. 14, p. 56) will not assure deferments by the Selective Service System's draft boards. That is the opinion of industry representatives in Washington who have been following this situation. Under the total mobilization that would be required for a full-scale war with Russia, the draft boards would be given large quotas and would have to fill them.

It means that in industrial areas, where large numbers of men in the draft-age group are employed in the listed critical occupations and essential industries, employers soon would be confronted with difficulties in manning critical jobs. The lists compiled by the Labor and Commerce Departments are regarded as practical guides in granting deferments to members of the armed force reserves and to national guardsmen in the present limited emergency, but are too liberal to be practical in a full war emergency.

Weekly Earnings Rise

Weekly earnings of the 12.1 million production workers employed in manufacturing industries increased slightly to a new peak of $59.02 in mid-July, according to preliminary estimates of the Labor Department's Bureau of Labor Statistics.

The factory workweek, averaging 40.4 hours, continued the preceding month's level despite the July 4 holiday and signified more overtime work than in any month since the end of 1948. Manufacturing output in July also showed no change from the June peak, according to the Federal Reserve Board's index. Biggest

workweek increase was in ordnance and ordnance accessory activity where workers spent an average of 42.4 hours a week at the job, a new postwar peak.

Preliminary reports also indicate that gross hourly earnings for production workers in the nation's manufacturing establishments as a whole increased by more than 5 cents over the year to $1.461 in the 12 months prior to mid-July, 1950. The increase is accounted for largely in the durable goods industries because of minor wage rate advances and more overtime payments.

Labor Shortages Hit Midwest

Shortage of men, particularly those with special skills, is blocking expansion plans of a number of midwestern metalworking plants. "We can't fully staff a one-shift operation, let alone add a second shift," is the plaint of one durable goods maker.

The shortage is getting worse fast. Within the next week or two when a new school year begins it will assume more critical proportions. And personnel men doubt that their problems will be eased by increasing their intake of women or of marginal workers. The draft has hardly made a dent yet in the total labor force, but it's bound to eventually.

Metalworking plants in Chicago's Calumet industrial area report a general shortage of skilled men. One personnel director predicts the new Budd wheel plant will tighten that area's supply still further. Inland Steel, which would like to add about 1 per cent to its total force, complains that most of the men it needs are in skilled categories and hence are difficult to find. By December Pullman Standard Car Mfg. Co. expects to have to add 1000 men at its Michigan City freight car shop if a second production line is put into operation.

Companies which have no immediate need for sizable additions to their work force are picking up men on a limited scale— just in case.

Iron Fireman Gets Subcontracts

Iron Fireman Mfg. Co.'s plant at Portland, Oreg., is in a state of changeover because of a stepped-up subcontracting program for Boeing Airplane Co.

Iron Fireman made many Boeing parts during the last war and renewed that activity several years ago. Now new contracts call for about 2000 different items.

Nearly all the company's oil burner manufacturing operations will be moved to the Cleveland plant by Oct. 1.

Suppliers Gear for Tanks

They'll get a big chunk of the $1036 million that will be spent on combat vehicles

GAS TANKS and shut-off valves, instrument gages and exhaust mufflers, shock absorbers and torsion bars, track assemblies and electronic equipment—those are just a few of the hundreds of parts that will be needed by prime contractors for the nation's tank and combat vehicle-building program. Parts suppliers will dig deep into the $1036 million that will be spent by the Army for tanks and combat vehicles out of the supplemental $4 billion military appropriation. Subcontractors will be setting aside part of their production schedules for military output in the coming weeks as orders for tank components fan out through the ranks of metalworking.

Right now the military is planning an expenditure of $98 million for the T-41 light tank that Cadillac is preparing to produce at the former Cleveland bomber plant. Like other tanks in the combat vehicle program the T-41 will comprise four major elements: Hull and turret (counterpart of an auto's chassis and frame), armament (cannon, .30 and .50 caliber machine guns), central fire control system (electronic), and power plant and transmission.

Hull and Turret—Cadillac will handle almost all the major work on the hull and turret for the T-41. It will use rolled armor plate for the most part. In line with the Ordnance Corps' plan to get the widest possible dispersion of subcontracts on all tank orders, companies like Standard Steel Spring, Carnegie-Illinois and Inland Steel will probably supply the alloy plate used for tank armor.

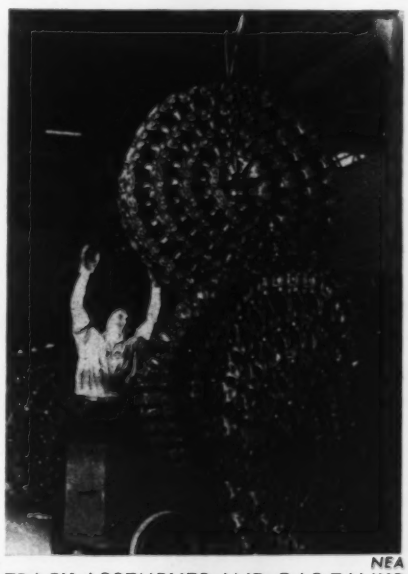
A number of foundries also have orders for limited amounts of armor to be produced to a new specification for tanks now being produced or contemplated.

Armament and Fire Control—To arm the T-41, the Watervliet arsenal, which supplies all armament for Army tanks, may have to get help from some suppliers. Last week it was contemplating the letting of contracts for gunnery.

The Frankford arsenal, supplier of central fire control systems for tanks, has not yet let contracts. If it does, it is likely that Bausch & Lomb Optical Co., Vickers Inc. and/or International Business Machines Corp. will get the job.

Power Plant and Transmission—Continental Motors Corp., Muskegon, Mich., will supply the engines for the T-41 as well as for other tanks in the entire program. Allison Division of General Motors is already scheduled to build the transmissions.

The Cadillac program is not being planned for the Korean War only. Edward N. Cole, Cleveland Tank Plant manager for Cadillac, says an attempt is being made to locate all machinery peculiar to tank building in the shadow of big industry. Other machinery needed for tank production, but not peculiar to it, will be ordered when needed. Thus Cadillac will be in a position not only to build tanks for the present emergency but to be able to expand rapidly if the international situation worsens.



NEA

TRACK ASSEMBLIES AND GAS TANKS
. . . parts suppliers will dig in deep

Railroad Buying Jumps

Class I railroads and their subsidiary refrigerator car companies ordered 24,113 new freight cars in July. The roads had 64,235 freight cars on order Aug. 1.

The July increase in orders placed represents only a portion of the additional cars ordered or in process of being ordered by the railroads. As announced at a meeting in Chicago of the Association of American Railroads (STEEL, Aug. 7, p. 55), additional orders will include about 63,000 more than the 40,000 cars awaiting delivery July 1.

New locomotives on order Aug. 1 totaled 1132, including 1106 diesels, 22 steam and 4 electric units. That was an increase of 132 locomotives compared with the number of all types on order July 1.

Class I railroads and their subsidiary refrigerator car companies put 15,988 new freight cars in service

in the first seven months of 1950. Of that number, 3193 were installed in July.

Class I railroads started using 1289 new locomotives in the first seven months of 1950; 162 went into service in July.

How Much Steel for War

Peak requirements in World War II were 38 per cent of total shipments

HOW MUCH steel is required to wage an allout war?

Steel shipments for direct war uses during World War II reached a maximum of 22.8 million net tons in 1943, or 38 per cent of total steel shipments that year. Direct war uses include ordnance, projectiles, tanks, aircraft, all shipbuilding, cantonments and defense plants.

Many other uses contributed to war and essential civilian purposes, such as containers, railroads, trucks, oil, mining and agriculture.

In 1944, the year of record steel production, direct war shipments were 19.9 million tons, or 32.9 per cent of all shipments. The figures are from data compiled by the American Iron & Steel Institute.

Among the largest and most fully sustained civilian demands was that of the railroads, running 7 to 9 per cent of all steel shipped each year.

In 52 months, from the beginning of 1941 through April, 1945, makers of ordnance, projectiles and tanks received 9 per cent of total steel shipments. Meanwhile 5 per cent of all shipments went into the construction of defense plants, cantonments, bases and similar uses. Ship building, both naval and commercial, took 13 per cent of the steel. Most of the ships and defense plants, and many cantonments erected during the war are still in use or in stand-by condition.

The total amount of finished steel delivered to shipbuilders, and makers of ordnance, projectiles, tanks and aircraft in the 52 months was 63,568,000 tons, almost one-quarter of total shipments. This was 2.4 million tons less than the annual shipments of steel for all purposes in 1948.

Harrison: Allocations Chief

Allocations chief under the Defense Production Act of 1950—now nearing the final enactment stage—is to be Maj. Gen. William Henry Harrison, according to present administration plans. He is slated for this post by Secretary of Commerce Sawyer.

General Harrison has had extensive experience qualifying him for this assignment: He was drafted from the communications industry in 1941 to fill an important job in the Office of Production Management. In 1942 he became director of production for the War Production Board. Late that year he was commissioned brigadier general, and in 1943 major general, and was made director of procurement for the Army Service Forces. General Harrison now is president, International Telephone and Telegraph Co., New York.

GEN. W. H. HARRISON

. . . extensive qualifying experience

Won't Supply Gray Market

United States Steel subsidiaries are not supplying steel to gray market operators.

This categorical denial of President Ben Fairless apparently is prompted by tactics of would-be gray market operators who have been telling potential customers they can obtain steel from the corporation at premium prices.

"The policy of United States Steel continues to be one of selling steel only directly to bona fide customers at regular published prices. United States Steel will decline to make further sale to any purchaser who is found to have resold in the gray market steel bought from the corporation," says Mr. Fairless.

Scrap Heads Toward Record

Steel mills and foundries will melt about 61 million gross tons of iron and steel scrap this year, topping record 1948 by at least 3 million tons. This is estimated by Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel Inc.

To Aug. 1, the scrap consumption was 33.7 million gross tons, said Mr. Barringer. In the same period of 1949 it was 31.6 million tons, and in 1948, the alltime high, 33.5 million tons. Currently, and presumably also for the remainder of the year, the monthly melt of scrap is about 5.4 million gross tons.

Scrap Advisory Group Named

An advisory committee available to any government agency desiring to consult on any part of the iron and steel scrap situation as it relates to the defense program has been appointed by the Institute of Scrap Iron & Steel, Washington.

The committee has a widespread representation of dealers and brokers.

Bailed Out Again

The sheet shortage postpones once more the expected demise of hand mill sheet facilities

THE GROWING scarcity of sheets is giving a new lease on life to hand mill sheet producers.

To meet the heavy demand for plain, hot-rolled, pickled and galvanized sheets and to insure a good supply of sheet bars, Whitney-Apollo Corp., Apollo, Pa., has purchased one 3-high breakdown mill and three 2-high, semiautomatic finishing mills at Detroit Steel Corp.'s Portsmouth, O., plant for more than $1 million.

Wipe Off the Cobwebs—Whitney-Apollo will produce about 5000 tons of sheets monthly at Portsmouth under a leasing agreement with Detroit Steel. Those mills have been idle since May, 1949. An additional 3-high mill may be installed soon, boosting sheet capacity to 8500 tons monthly. Under the agreement, Detroit Steel will supply sheet bars to Whitney-Apollo's hand sheet mills at both Apollo and Portsmouth. Output of sheets at Apollo has been averaging about 10,000 tons monthly.

The old Chapman-Price hand sheet mill facilities at Indianapolis reportedly will be placed in operation soon under the name of Sheet Steel Mills Inc.

Deals Pending — Negotiations are under way for resumption of operations on the one 3-high breakdown mill and three 2-high finishing hand mills at Toronto, O. These facilities were operated briefly by Steel Producers Inc., and then sold to Volco Brass & Copper Co., Kenilworth, N. J.

Other facilities that may be operated at Toronto include four 50-ton basic open hearths and one 2-high 1-stand 8-inch reversing billet mill previously operated by Follansbee Steel Corp.

Salvage Job—Although shears and other production facilities at Hudson

Motor Car Co.'s New Castle, Pa., sheet mill operations have been liquidated, the mills could be returned to operating condition. Hudson is no longer interested in operating the facilities, but other companies are considering taking over the job.

One basic problem in rejuvenating hand sheet mill operations is the critical shortage of sheet bars. Some interests have made heavy commitments with foreign supply sources at prices comparable to domestic quotations of $85 to $100 per ton.

GE Forms Mobilization Unit

General Electric Co.'s apparatus department formed a Mobilization Planning Committee to co-ordinate for the department the "requests from the Department of Defense and its agencies for information concerning facilities, personnel, possible production schedules and other procurement matters for national defense."

Chairman of the committee is Neil Currie Jr., administrative assistant to H. V. Erben, vice president and general manager of the GE department.

Harvester To Enlarge Foundry

Enlargement of International Harvester Co.'s research foundry in Chicago is to begin immediately as the second phase of a two-stage foundry installation.

A fortnight ago the company held a dedication ceremony marking completion of the first stage, under which basic elements and departments necessary to carry on research in all phases of foundry operations were installed.

Purpose of the new foundry is twofold: Primarily it will be concerned with research leading to improved technical knowledge and processes. Second will be development of skilled foundrymen.

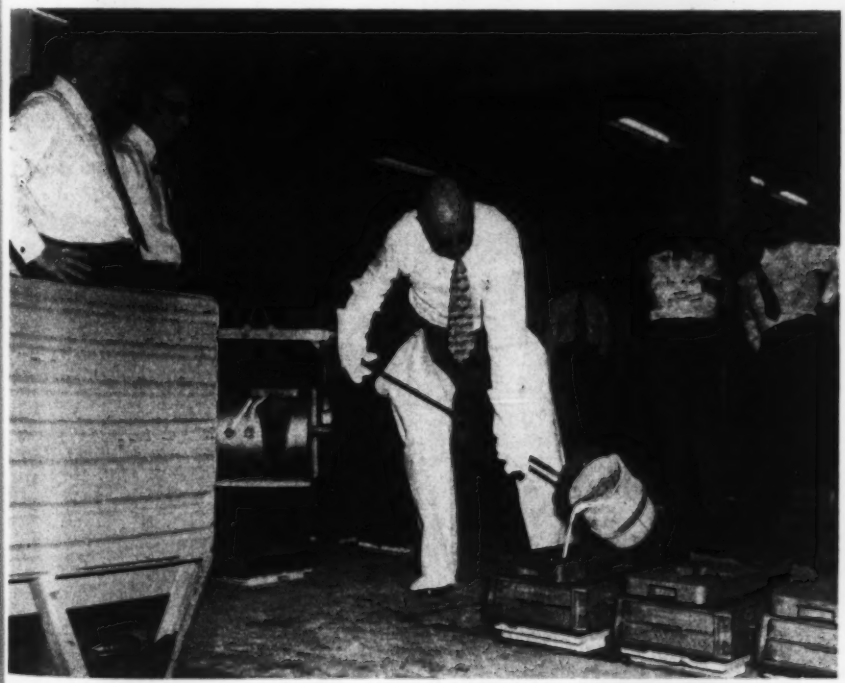
When the $1.2 million foundry operates at peak of its research and training program it will employ about 65 people. Currently it is manned entirely by college graduates.

The first stage installation includes a 1000-pound per hour direct arc electric furnace, molding sand preparation unit, various types of molding machines, core department, cleaning department, complete foundry laboratory and a pattern shop.

Second stage will include addition of a "closed" cupola. The foundry will be completely mechanized and first stage equipment will be multiplied, and the whole foundry enlarged.

Barium Unit Gets Engine Maker

Barium Steel Corp.'s subsidiary, Republic Industries, has reacquired Jacobs Aircraft Engine Co., Pottstown, Pa.



RESEARCH FOUNDRY: When International Harvester held a dedication ceremony signifying the end of the first phase of its two-stage foundry installation, Harvester President John L. McCaffrey poured the first ladle of gray iron. He is observed by M. J. Graham, director of manufacturing, and A. W. Anderson, assistant general supervisor of foundry research, both on the left, and Gen. Levin H. Campbell Jr., executive vice president, in the background, arms folded. At the right is Frank G. Steinebach, editor of *The Foundry*, a Penton publication

Republic Industries, acquired by Barium in 1946, had owned Jacobs from 1945 to 1947. In February, 1947, Jacobs was resold to Albert R. Jacobs, with Republic taking a mortgage of $1.5 million and as collateral all 2000 shares of Jacobs stock.

The mortgage has been pared to $1,350,000 but went into default on both principal and interest. So all Jacobs stock and the mortgage are now owned by Republic. In World War II Jacobs produced more training plane engines than any other U. S. manufacturer.

Amortization as Before

World War II's five-year liberalized depreciation plan is resurrected by a Senate group

THE SENATE Finance Committee has adopted a five-year depreciation provision for war plants and facilities as a part of its interim defense tax bill.

That would restore the World War II program for faster amortization of arms-producing plants and related facilities. The depreciation speed-up would permit taxpayers to write off for tax purposes the cost of a certified property at 20 per cent a year for a five-year period beginning in 1950. There could be no variation in this 20 per cent rule.

The accelerated depreciation plan would be available only to companies certified by the government. The President would designate the certifying authority. Thus, the scheme would not be available to business generally. Businesses not certified for war purposes would continue to operate under existing tax laws that permit depreciation for tax purposes based on the estimated useful life of a given property.

The depreciation speed-up is similar to the World War II law with one exception—that law gave authority for even less than five years' depreciation if the President terminated the emergency during the five-year period. There's no such provision in the new proposal.

Business men who want to take advantage of the plan will have to apply for it. The government itself will not take the initiative in extending the proposal to any business or group of firms.

Chances for the proposal's acceptance by Congress and the administration are fairly good. Treasury Secretary John Snyder opposes a general depreciation scheme, but he has been quoted before a Senate committee as saying he would "welcome" a limited plan.

Brooke Iron Sold

Lukens and Worth sell their stock in the pig iron producer to Bayou Interests Inc.

STOCK interest in the E. & G. Brooke Iron Co., Birdsboro, Pa., held by Lukens Steel Co., Coatesville, Pa., and Worth Steel Co., Claymont, Del., was purchased by Bayou Interests Inc., controlled by Allen & Co., 30 Broad Street, New York, and associates. Interest was acquired as an investment; purchase price not revealed. There will be no stock offering.

The Brooke company owns a blast furnace with an annual capacity of 151,200 net tons, and has an ore property at Wharton, N. J. Operating management will continue unchanged.

Quotas Continue—Interest in the Brooke company was acquired by Lukens, Worth and also Warren Foundry & Pipe Corp., New York, Dec. 1, 1947. Under the arrangement these companies were to be given in excess of 90 per cent of the blast furnace's production for five years. Warren retains its original interest, and under the latest agreement Lukens and Worth will continue to receive their quota of iron for the remainder of the five-year period, or until Dec. 1, 1952.

Because of the recent stock purchase, seven directors of Brooke have retired. Seven new directors are: Harold Allen, brother of Charles Allen Jr., chairman of Allen & Co.; S. W. Harder and Frank H. Blair, also affiliated with the Allen company; M. L. Sindeband, chairman, Derby Gas & Electric Corp., New York; John Whitney, Riter & Co., investments, New York; John Holtzman, of the law firm of Holtzman, Wise, Shepard & Kelly, New York; J. Cooper Graham, Lutherville, Md.

Six Remain—Six directors continuing on the board are: F. Ward Coburn, president, E. & G. Brooke Iron Co., and Robert C. Brooke, vice president in charge of sales of that company; Edward H. Worth, Jr., treasurer, Worth Steel Co.; George Whelpley, chairman, Warren Foundry & Pipe Corp.; and L. D. Dohm, president of that company; and J. W. Herman, treasurer, Lukens Steel Co. Of retiring members, two were with Lukens and one with Worth.

Brooke had (and still has) 168,065 shares outstanding at the time the two steel companies and Warren acquired interest late in 1947. These companies acquired 118,795 shares, Lukens taking 48 per cent of that amount at a cost of around $906,000. The stock was valued at that time at approximately $16 a share.

Caterpillar Forms U.K. Firm

Caterpillar Tractor Co., Peoria, Ill., formed a wholly owned British subsidiary, Caterpillar Tractor Co. Ltd. The new company will procure, inspect, store and ship British-made Caterpillar parts to the company's dealers in the United Kingdom and other countries.

The new activity in England was made necessary because of the dollar shortages abroad, the devaluation of currencies and the rising sales of spurious foreign-made parts.

Incidentally, the first steel erection of the new Caterpillar plant at Joliet, Ill., began early this month, says T. R. Farley, vice president. Present plans are for final assembly operations from component parts produced by Caterpillar and present subcontractors to start even before the building is completed and the necessary machinery for fabrication is installed.

GE Boosts Gas Turbine Output

Large-scale production of gas turbines, latest type of power plants for land, railroad and marine use, has been started by General Electric Co. in Schenectady, N. Y. Plant facilities are now being equipped at a cost in excess of $4 million.

Nat'l Battery Now Gould-Nat'l

Gould-National Batteries Inc. became the name of the National Battery Co. early this month when the stockholders of National approved the change proposed by the board of directors. The same sales and field engineering organizations that served heavy industry, mining, the railroads and telephone companies under the name of Gould Storage Battery Corp. will now operate under the new name, Gould-National. Sales and field engineering headquarters will continue to be located in Trenton, N. J.

Precision Parts Maker Formed

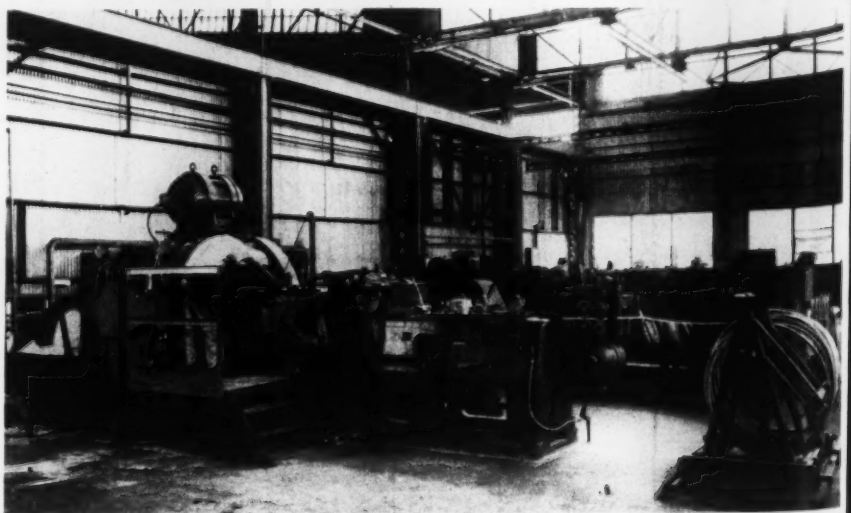
Ardec Inc., Media, Pa., was formed to produce precision parts and assemblies for the aircraft, automotive, electronic, small arms and other industries. The new company will also handle special engineering and research problems, including production of prototype and testing units. William A. Arnken is president.

Rem-Cru Names Its Officers

Rem-Cru Titanium Inc. has named its officers. It's a new manufacturing company for titanium and titanium alloy products jointly owned by Remington Arms Co. Inc. and Crucible Steel Co. of America. Chairman is C. K. Davis, president and general manager of Remington. President and a director is W. H. Colvin Jr., president of Crucible.

Chicago Firm Buys Acme Plant

United Specialties Co., Chicago, acquired the plant of Acme Pressed Steel Co. at Powderly, Ala. United's subsidiary, United Specialties of Birmingham Inc., will continue to make



BOLTMAKER: First of two new 35-ton automatic boltmakers was installed in the Los Angeles bolt and nut plant of Bethlehem Pacific Coast Steel Corp. Largest in the West, the big boltmaking machine produces cold-forged square and hex head machine bolts from ½-inch by 1 inch to ⅝ inch by 6 inches at a 3000 bolt-per-hour rate. Operations are fully automatic from wire drawing to rolling of threads

a line of metal toys and will add $125,000 worth of machinery and equipment for production of 4000 carburetor air cleaners a day.

Atlas Votes To Change Its Name

Atlas Imperial Diesel Engine Co. has called a special meeting of stockholders for Sept. 1 to vote on a plan to dispose of its diesel engine business and change its name to Atlas Glass & Can Co.

The company's sales of diesel engines declined to $5,262,000 in 1949 from $8,328,000 in 1947. The bulk of its engines and parts have already been purchased by National Supply Co., Pittsburgh, for $418,000. The remainder, it is expected, can be sold at a profit that will largely offset the loss of $100,000 sustained on the National Supply sale.

The company will continue development of its other lines, including manufacture of glass containers, peach pitters and cans. Sales of these products have increased steadily in recent months.

Norton Opens New Warehouse

Norton Co. has opened a new $150,000 warehouse and district office on Butler road in Shaler township six miles from downtown Pittsburgh to replace the old facility in Pittsburgh.

Ground for the new building was broken last March, and final work will be completed soon. The new 12,000-square-foot building is equipped to give service on all types of grinding wheels, polishing and tumbling abrasive grain, diamond wheels, abrasive bricks, sticks, blocks and segments and also mounted wheels and points.

Charles B. Price is Pittsburgh district manager. Norton's general offices are in Worcester, Mass.

National Tube's New Product

National Tube Co. developed "National Deep Well Casing" as a new product to meet the oil industry's trend toward producing deep wells.

The U. S. Steel Corp. subsidiary installed special production facilities to produce the quenched and drawn steel. Depending upon the size of the casing involved, the price of the new product ranges from $186 to $198 a ton.

Hooker-Detrex Completes Plant

Hooker-Detrex Inc., completed a trichlorethylene manufacturing plant at Ashtabula, O. The facility will produce metal degreasing solvents for Detrex Corp., Detroit. Capacity production is expected by Nov. 1. Hooker-Detrex is a jointly owned subsidiary of Hooker Electrochemical Co. and Detrex Corp.

OOPS! A 31-year-old Oldsmobile landmark makes way for progress as this 225-foot smokestack at Lansing, Mich., is leveled to clear the area for a new multimillion dollar steel storage and plant engineering building. In the background are the walls of Oldsmobile's first sheet metal and enameling plant. It will be razed along with six other buildings. The steel storage and plant engineering building will be 325 by 508 feet, will contain 175,000 square feet and will have high craneways and two railroad spurs for unloading material

NYU Gets Research Contract

International Nickel Co. awarded a contract to the Research Division, New York University's College of Engineering, covering studies of the dimensional stability of stainless steels and the nature of rupture in stress-rupture tests. The project will be directed by Dr. John P. Nielsen of the chemical engineering department.

Boeing Plans Expansion

Boeing Airplane Co. will spend $3 million to increase its Seattle research and manufacturing facilities.

The program calls for spending $1.5 million to expand the company-owned wind tunnel. The balance will be for new machines and tools, as well as additional office accommodations. The project will begin immediately and take about 20 months to complete.

Mold Plant for Chicago

Vulcan is expanding to avoid losing western business because of freight rate increases

VULCAN Mold & Iron Co. will build a $1 million plant in the Chicago area to avoid losing business because of freight rate increases. The company's general offices and main plant will remain in Latrobe, Pa.

The new mold plant, first of its kind to be built in the Chicago district in the last 25 years, will occupy part of a 50-acre tract in Lansing, a suburb of Chicago. The project was undertaken to overcome freight rate increases which have restricted Vulcan's western trade, says James M. Underwood, company president. The firm's business in the Chicago district and current growth of the steel industry in the area dictated the move, he says.

More Molds for Chicago—The new plant will be designed to produce about 50,000 tons a year, an increase of more than 50 per cent beyond Vulcan's present capacity. Construction will begin early in September. It should be completed by next Apr. 1.

The plant will be known as Vulcan's Chicago division and will employ about 150 at the start. Vulcan was founded in 1923 and makes ingot molds in a weight range of 250 to 60,000 pounds.

Sloss-Sheffield Builds Lab

Sloss-Sheffield Steel & Iron Co. will build a research laboratory and pilot plant in Birmingham. The facility will cost $100,000 and will be the first step in a projected $500,000 laboratory. Dr. William M. Lofton Jr. is research director.

Aeroquip Corp. Expands

Aeroquip Corp., Jackson, Mich., will spend $500,000 to expand its plant. Unfilled orders for the company's flexible hose lines and fittings exceed $2 million, about double the backlog a year ago. A further increase is expected when the new procurement of military aircraft gets under way.

Laundry Machine Firm Bought

American Laundry Machinery Co., Cincinnati, purchased Huebsch Mfg. Co., Milwaukee. The Milwaukee firm becomes Huebsch Division of American Laundry, but will continue to operate separately and manufacture its lighter laundry and dry cleaning equipment.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

National Inventors Council comes in mighty handy in emergency times. It ascertains the armed services' technical needs and evaluates ideas submitted to it by inventors

DURING World War II the National Inventors Council had the formidable task of combing through some 250,000 suggestions and inventions—looking for things that would help win the war. The council found 150 that definitely did help win the war. Among them were the famous land mine detector invented by a Miami mechanic and the mine destroyer developed to counteract the German's use of nonmagnetic mines made of plastic.

Voice Behind the Curtain—Right now the most important activity of the council is to develop a means of getting the Voice of America through the jamming of radio channels behind the Iron Curtain. A group of 40 inventors are working on the problem. Outlook for a solution is good, says Charles F. Kettering, head of the council.

How does NIC operate? It ascertains the technical problems of the armed services and communicates the information to the country's recognized 3000 inventors. It evaluates all ideas that are received and discusses them with the proper military officers. When desirable, interviews are arranged for the inventors with the proper military men.

Pit your Wits—In conference with representatives of the armed forces, the council is preparing a new list of military technical problems that require solution. The list will be released shortly. Until that is released inventors are urged to pit their wits against some of the still unsolved problems of last year's list. Among the unsolved problems on the list are some of special interest to metalworking:

A new method for transmitting intelligence; lightweight equipment for translating speech into writing; radiation indicating and measuring equipment; lightweight equipment for heating dry batteries used in subzero temperatures; portable steam generator and nozzles for jetting and thawing frozen ground; rooters for expeditiously loosening frozen ground for use in road building, bridge approaches, airfields, etc.; device to silence vibrations on engine generator sets; lightweight high-voltage generator; substitute for carbide method of generating acetylene; method of assembling steel gasoline tanks so they will be leakproof, and so they may be disassembled and reassembled without damage to tank parts; plug which will permit plug valves to operate at minus 65° F.

> GOT ANY IDEAS on new or improved weapons or gadgets that will add to the striking power of the United States? If you have, get in touch with the National Inventors Council, Commerce Bldg., Washington 25. The council is intensifying its activities after a letdown following World War II.
>
> Charles F. Kettering, chairman of the council, says: "We have been asked to get started again on stimulating the inventors of America to get busy on inventions to enable our country to cope with numerically superior forces."

Interested? — More problems that need solution: High-strength, lightweight coupling for gasoline pipelines; means for compacting snow to support aircraft and military vehicles; permanent, legible markings for shipping containers; preservatives and protective coatings which may easily be removed from equipment and supplies at minus 65° F; erosion-resistant material machineable at room temperature; lightweight expendable pallets for use with lift-trucks. Interested parties may obtain a copy of the list by writing to the council.

So that the council may have ample facilities, it has been provided with a staff in the Commerce Department's Office of Technical Services. And John C. Green, OTS director, is the council's chief engineer. Members of the council, in addition to Mr. Kettering, chairman, and Lawrence Langner, secretary, are Dr. Roger Adams; Dr. George Baekeland, Dr. Oliver Buckley, George W. Codrington, Dr. William D. Coolidge, Watson Davis, Dr. Frederick M. Feiker, Dr. Webster N. Jones, Major General Ward H. Maris, Commissioner of Patents John A. Marzall, Maj. Gen. Donald L. Putt, Rear Adm. T. A. Solberg, Homer H. Ewing, Luis de Florez and James C. Zeder.

War and Ideas—About 25 per cent of the listed problems "get solved," says Dr. Kettering. There has been a big increase in the number of incoming, unsolicited suggestions since the outbreak of the Korean war.

Cold Extrusion of Shell Promising

The Army Ordnance Corps reports promising results to date under a contract with Mullins Mfg. Co. which will engineer a cold extrusion line for the production of shells. The material being extruded is 1010 plain carbon steel and the resulting shell is reported as having considerably better physical properties than had been expected. The shells being studied are the 105-millimeter M1 type, the size which the Army uses in the largest quantities. After the work on the 105-mm shell has been completed, production techniques are to be developed for 4½-inch rockets and 155-mm shell.

Production unit being used by Mullins is a 3000-ton Lake Erie hydraulic press. The Mullins contract calls for a report at conclusion of the program that describes manufacturing methods, press requirements, design of dies, and tonnage pressures required.

What's the Shape of Minerals?

The raw materials situation underlying the iron and steel industry is a No. 1 subject to be discussed at a special meeting, at Salt Lake City, Sept. 1, of the Interior Department's National Minerals Advisory Council. The question: In what shape are the mineral industries to support capacity steel operation in a war emergency? All factors will be considered—manpower availability, need for transportation facilities and for mining machinery and parts. Two committees will conduct this part of the program: The Ferrous Metals Committee, of which Alexander C. Brown, president, Cleveland-Cliffs Iron Co., Cleveland, is chairman, and the Alloy Metals Committee, of which S. H. Williston, vice president, Cordero Mining Co., San Francisco, is chairman.

The council's other five commodity committees will report on conditions in their fields. They are: Industrial Minerals, of which H. M. Al-

bright, president, United States Potash Co., New York, is chairman; Precious Metals, of which Donald H. McLaughlin, president, Homestake Mining Co., San Francisco, is chairman; Copper, of which Robert G. Page, president, Phelps-Dodge Corp., New York, is chairman; Lead and Zinc, of which Howard I. Young, president, American Zinc, Lead & Smelting Co., New York, is chairman; and Light Metals, of which L. M. Brile, president, Fairmount Aluminum Co., Fairmount, W. Va., is chairman.

Big Extrusion Press For Sale

A 12,000-ton extrusion press, one of the comparatively few German industrial items awarded to the U.S. as reparations, is to be sold by the State Department. It was built by Schloemann, Dusseldorf, for Vereinigte Leichtmetallwerke G. m. b. H., Hannover-Linden, for use in forming airplane parts and is only 40 per cent complete. Bids will be opened Oct. 10 by the Lend-Lease & Surplus Property Staff, Department of State, State Annex No. 7, 21st and C streets N.W., Washington 25. Prospective bidders may obtain forms and complete specifications from that office. Bids must be postmarked prior to midnight Oct. 6.

The same office will open bids Sept. 26 on another reparations offering—a line of 163 Soederberg process pots and accessory equipment for the production of primary aluminum.

Stressed-Skin Aluminum Tested

A prefabricated cold-weather building of stressed-skin aluminum sheet is being tested by the Army's Engineer Research & Development Laboratories, Fort Belvoir, Va. Primarily for troop use, it has lightweight parts and is easily erectable, even by relatively green soldiers. It is provided with heating and sanitation facilities and is designed to withstand winds of 100 miles per hour and temperatures as low as minus 65°F. It is made up of 8-foot side, roof and floor panels with honeycomb core and faced on both sides with aluminum alloy sheets.

1948 Minerals Yearbook Out

Copies of the "1948 Minerals Yearbook" are available from the Superintendent of Documents, Government Printing Office, Washington 25, at $4.25.

When it prepared the 1626-page book, the Interior Department gave much greater attention than ever before to foreign minerals due to the importance of imported materials as they affect the United States domestic economy.

As usual, the work is replete with information and statistics on production, distribution and consumption of all mineral commodities, metallic and nonmetallic, including fuels.

VICE ADM. EDWARD L. COCHRANE
Chairman, Federal Maritime Board

New Maritime Administrator

John T. Koehler, who served as acting chairman of the Federal Maritime Board and acting Maritime Administrator (the first named job is an independent one; the second is in the Commerce Department; STEEL, July 10, p. 62) decided to resume his activities as assistant secretary of the Navy. He was succeeded by Vice Adm. Edward Lull Cochrane (U.S.N. Ret.) who was sworn in as chairman of the Federal Maritime Board early this month. Admiral Cochrane also takes the job of Federal Maritime Administrator in the Commerce Department.

He was chief of the Navy's Bureau of Ships in World War II, having charge of the Navy's shipbuilding program at the time. When he retired he became head of the Massachusetts Institute of Technology's Department of Naval Architecture & Marine Enginering. He is now on leave from M.I.T.; he will be chairman of the Federal Maritime Board for two years while serving as Maritime Administrator.

Admiral Cochrane was the winner of the David W. Taylor medal for notable achievement in naval architecture and marine design in 1945. He attended the University of Pennsylvania, the Naval Academy, Massachusetts Institute of Technology and the Naval War College.

A 'Number of Employees' Definition of Small Business

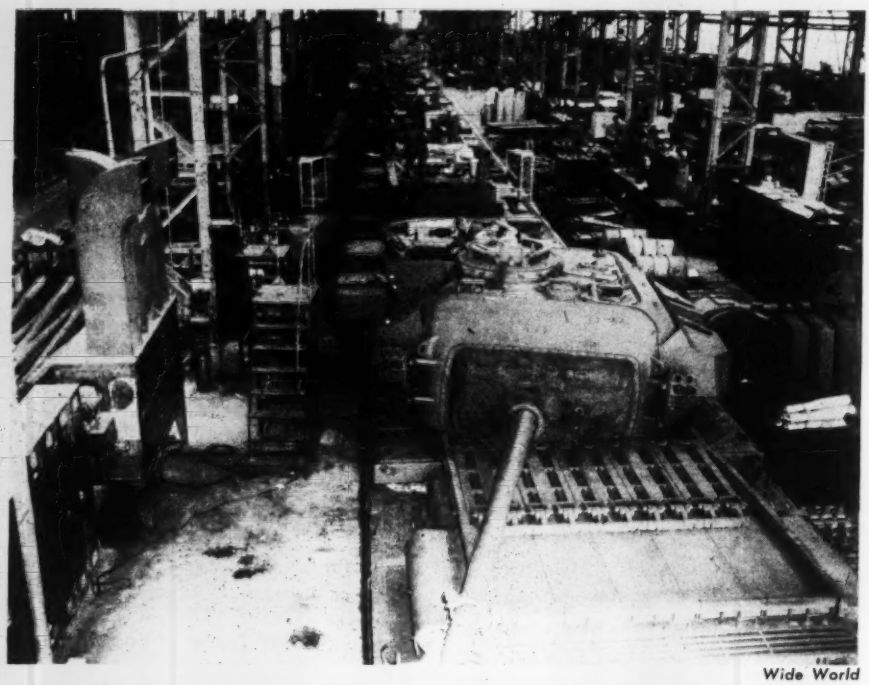
THE PERCENTAGE of government procurement that should be placed with small business and the amount of materials to be made available to small business if allocations controls become effective are two matters of vital importance to business. A study now underway by the Commerce Department's Small Business Division will have an important bearing on both.

As a starter, the division has attempted to answer the widely-asked question "What is a small business?" After a study of the 452 industries reported in the Census of Manufactures, it came up with the conclusion that the number of employees identifying a small business concern varies greatly for various industries. It has attempted—in a preliminary way, subject to such revision as may be proved warranted after further study—to indicate the maximum number of workers a plant may employ and be recognized as a small establishment. If a plant in any one of these industries has a working force no larger than the number next to it, it is "small business:"

Aircraft	1500
Steel works and rolling mills	2500
Nonferrous metal rolling mills	225
Machine tool	400
Other metalworking machinery	325
General industrial machinery	175
Construction and mining machinery	375
Textile machinery	250
Farm machinery except tractors	250
Paper industries machinery	225
Cutting tools, jigs and fixtures	100
Hand tools	200
Steel forging	250
Metal stamping	200
Gray iron foundry	175
Nonferrous foundry	100
Fabricated pipe and fittings	100

Backing the overall study of the 452 industries is a series of detailed studies of the separate industries in the census.

The first to be completed is that for the food and allied products industry, containing 39,933 plants. Of the $9 billion annual business of this industry, the portion done by "small business"—that is, plants employing fewer than 100 workers—is $3250 million. On the basis of this tabulation, plants with fewer than 100 employes would be assured of allocations of substantially one-third of the industry's raw materials if the government should use such controls.



Wide World

CENTURION: Britain's new 50-ton super tank, the Centurion, rolls down one of the assembly lines at a Royal Tank Factory somewhere in Britain. The tank, being produced by production-line methods, is an amphibian. It is powered by a 635-horsepower adaptation of the Rolls Royce Meteor aircraft engine

West Europe Feels the Korean War

Korea has given industry a new lease on life, encouraged inflation, sidetracked the Schuman plan and improved chances to boost the output ceilings in Germany

THE KOREAN war thus far has had four major effects on the European business outlook:

1. It has given metalworking industries their second wind; they're now operating at record or near-record rates.

2. It has given a twist to another inflationary spiral.

3. It has sidetracked the Schuman plan; the need for a steel pool no longer seems so urgent now that mills in Western Europe have all the business they can handle.

4. It has served as a big wedge for those who wish to boost the production ceilings in Western Germany.

The Comeback—The French expect to export a record 1,980,000 tons of steel in the second half of this year. The same story of new production and export highs in all metalworking products is repeated in all West European countries. Belgium, one of the hardest hit in the first half recession, is rehiring men and expects its industrial activity index to rise 20 to 25 per cent in the second half over the first.

Higher prices are accompanying the higher production tempo. Export steel prices are skyrocketing. Steel bars that brought $72 per metric ton at the end of July now cost $80 from Belgian mills. Sheets have risen from $78.50 to $82.50 per metric ton. Belgian export prices are the highest in West Europe, but quotations from others are rising.

Poor Midwife—The Schuman plan for pooling steel resources has many objectives, but one is to minimize the danger of recession. The present heady economic climate in Europe is not the ideal atmosphere in which to give birth to the embryonic program. For the time being, it is languishing as participants wrestle with details. Also not helping the Schuman cause any is the continued resistance from Britain. Although the British are only observers in the negotiations, their objections to a super-national agency to administer the program is another damper on enthusiasm.

Korea is dampening the Schuman cause, but it is stimulating the cause in West Germany for higher production ceilings. Ruhr steelmen want the limits raised on steel from the present 12.1 million tons yearly to 14.3 million tons.

That 14.3 million tons could be produced immediately. Another 660,000 tons could be added to West Germany's capacity in about a year if the August Thyssen works were rehabilitated. The Thyssen plant once had a capacity of about 1,650,000 tons of ingots annually, but the works have been bombed and partly dismantled, the chief reason why the total Ruhr capacity has fallen from the 17.6 million tons it had before the war.

Is the Ruhr Roof Too Low?

West Germany's steel production reached a new high of 1,155,000 in July. At that rate, the nation could produce 13.9 million tons a year. New orders booked in July amounted to 1,650,000 tons; 550,000 tons of that was placed by foreign buyers. The Ruhr steel industry now has enough order backlogs to assure full operations for the next seven months.

The high steel production rate puts a strain on scrap supplies. Coming up are controls on overseas scrap shipments. Domestic consumption climbed to 600,000 tons a month.

The Allies have lifted the embargo on steel exports into East Germany. Some 50,000 tons of steel will go to the Soviet area according to a treaty. The Russians have just cooked up a new five year plan for East Germany. From 1950 to 1955, pig iron production will be boosted from 375,000 tons annually to 1,375,000 tons; ingot output from 840,000 tons to 2,420,000 tons. The plans include the construction of a new steel mill with a capacity of 550,000 tons annually and of two new coal mines to produce 2,750,000 tons of bituminous yearly. Plans call for the production of tractors to reach 106,000 annually, of trucks 24,000 and of machine tools 30,000.

Belgian Steel Goes West

The strong demand from the U. S. is supporting the spurt in Belgium's steel export trade. The Belgians had a miserable first half when only 1,875,000 tons of steel were exported, 19 per cent less than that shipped overseas in the first half of 1949. Shipments are expected to exceed 2 million tons for the second half. The nation's steel mills are getting a good deal of America's business because of short delivery dates.

Production in other metalworking lines is improving, particularly among foundries which had been the hardest hit of any industry in the country. Prices for iron and steel castings have increased and deliveries are more extended.

Steel ingot production in Belgium

is running at about 17 per cent above the prewar rate.

The Records Fall in Britain

The British produced steel ingots at the rate of 16,089,920 tons in July, the highest rate ever achieved in that month.

United Kingdom industry was not hit by the first-half recession as severely as continental industries and exported about 1.6 million tons of steel in the first six months, 330,000 tons more than in the same period of 1949. Steel shipments to Canada more than doubled.

Some British manufacturers foresee a return of the system of steel allocations and controls that were only recently abandoned. The fears may prove groundless because steel inventories among consumers are the highest since the war.

In the first half British auto makers produced 262,500 cars and 135,000 trucks and busses. The combined total is 100,000 greater than the number assembled in the same 1949 period. Eighty per cent of the cars and almost 65 per cent of the trucks and busses were exported. More than 200,000 cars and 73,000 commercial vehicles were exported in the period. Canadian truck and auto purchases increased more than threefold to more than 38,500. British auto manufacturers hold nearly 1 million domestic orders for cars. Only 110,000 autos will go to the domestic market this year.

About 56,500 farm tractors were built in the first half; almost 70 per cent were exported. Shipbuilders, locomotive and freight car builders are booked to capacity.

Tariff Changes Unlikely

Few, if any, significant changes in the tariff position of iron and steel products are expected to be made at the third international tariff conference to be held in Torquay, England, in September. Import duties on steel products already are about as low as is possible under the Reciprocal Trade Agreements Act, says the American Iron & Steel Institute.

An exception to this situation is the case of tin plate on which a duty of 1c a pound or $20 a ton has applied since 1930. This is now open to a possible reduction to one-half that figure.

Belux Gets West Coast Agent

European steel producers, attracted by the current insatiable demand for metal, are starting to widen their toehold in the western steel market.

Belgemeric Corp., American and Canadian representative of a group of Belgium and Luxemburg steel mills, just established an office in San Francisco to channel more of the European market into the West Coast. Although no details were disclosed on how the Europeans will compete on price with domestic mills, previous shipments of steel to West Coast ports were sold at lower than going West Coast prices.

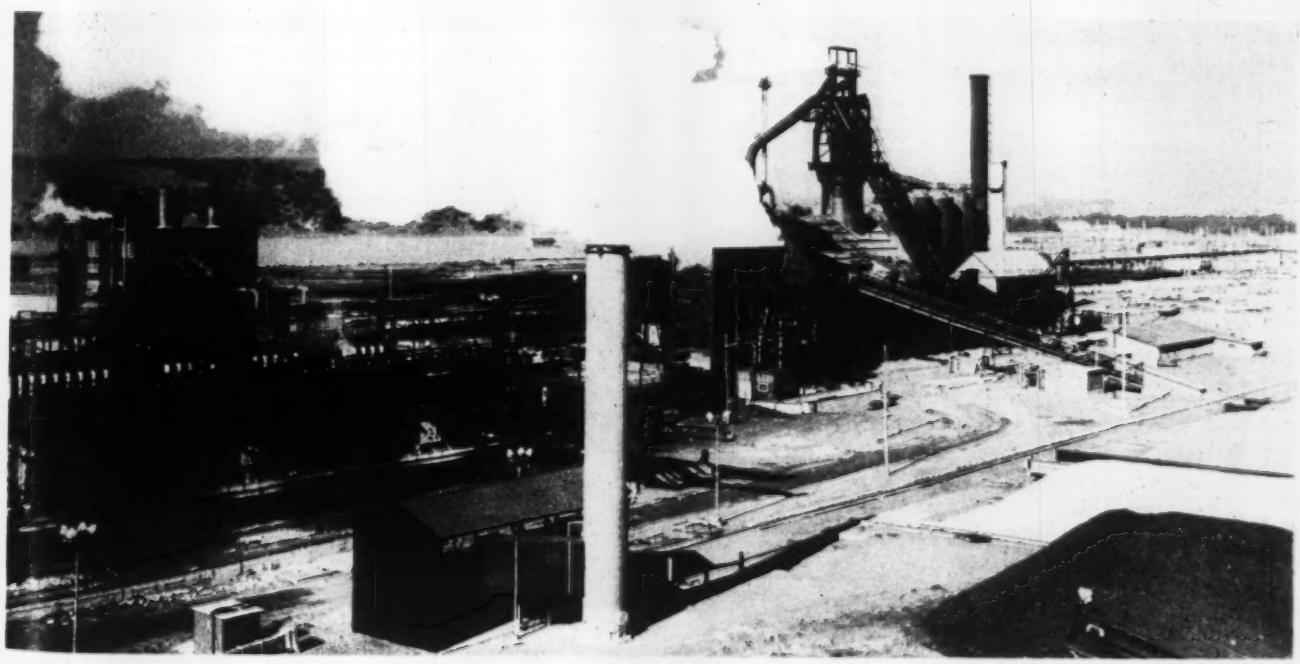
Manganese from Brazil

Bethlehem develops deposits near Amazon mouth; shipments before 1954 unlikely

MANGANESE ore deposits near the mouth of the Amazon river in Brazil are being explored by Bethlehem Steel Co. which expects to develop the property in partnership with Brazilian interests.

Development work will require several years and substantial shipments of manganese ore are not likely before 1954. The concession contract guarantees to the concessionaire the right to export 500,000 tons of ore a year.

Bethlehem engineers and geologists are handling exploration work and are making preliminary engineering studies for a proposed railroad and port facilities. Provision for transporting the ore to a point where it can be loaded into vessels is a major problem, probably involving the construction of about 140 miles of railroad. The company indicates that it will wait until enough ore has been "proved up" to justify the substantial cost before starting the railroad.



$90 MILLION PRODUCT: Chile's newest steel mill is the result of United States and Chilean teamwork. One of the largest integrated steel mills in South America, it will turn out 187,000 tons of finished products yearly. Corrugated iron sheets have already gone to Peru, Ecuador and Argentina. Of the total cost of $90 million for the mill, $48 million was lent by the Export-Import Bank and was used to buy U.S. equipment and services. The other $42 million was obtained from Chilean sources. The plant will turn out motor fuel and gas as by-products

It's easier with HYATT HY-LOADS

IN ADDITION to the "A-TS" bearing illustrated there are nine other major types of Hyatt Hy-Load Roller Bearings. Four have separable inner races, two have separable outer races and four are non-separable thus giving a designer a wide choice of bearings which permits flexibility in machine design and assembly procedures.

The "A-TS", one of the separable inner race type, is a high capacity cylindrical roller bearing made in two diameter series, wide and narrow widths, to standard AFBMA boundary dimensions.

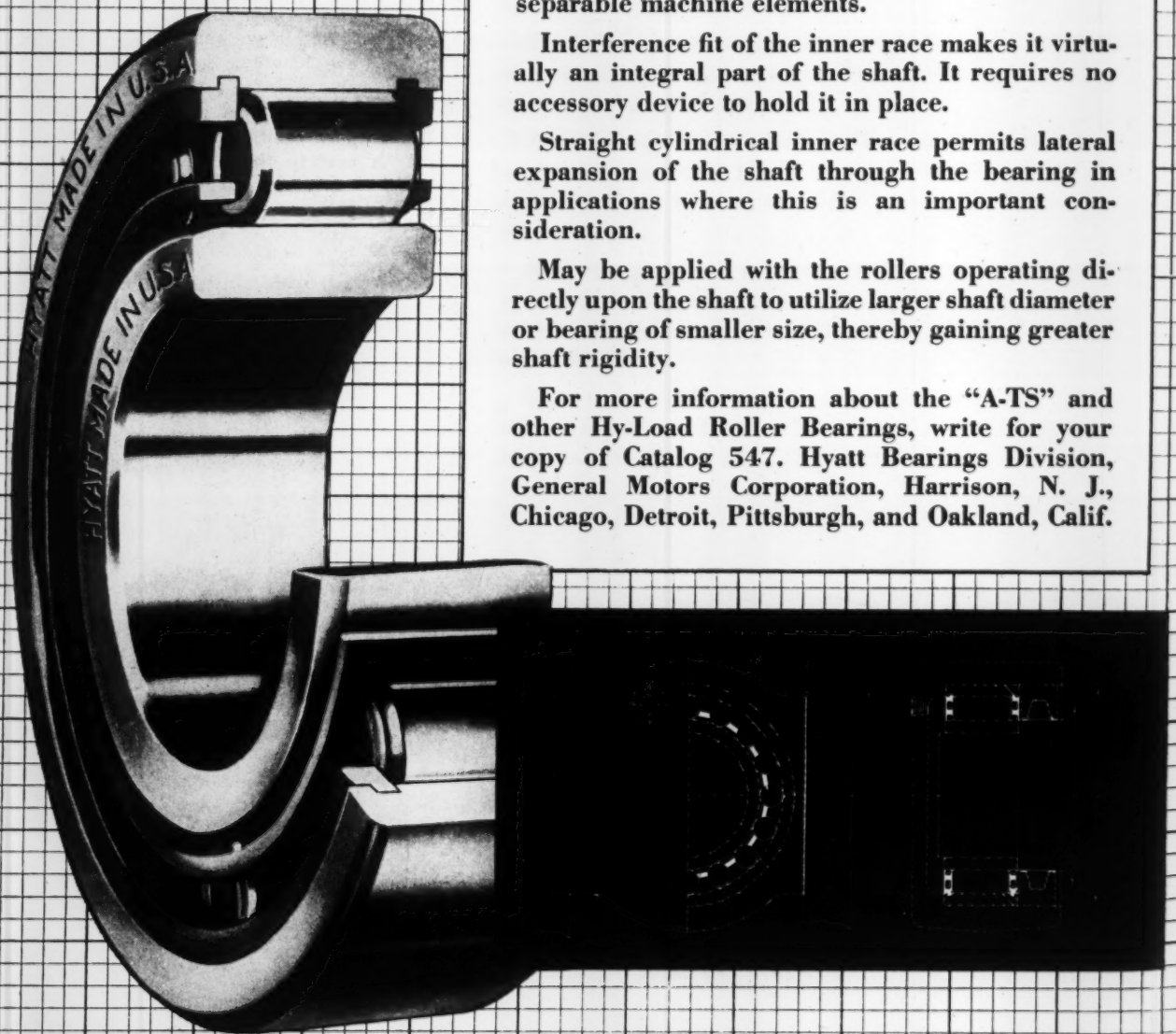
Separable parts are freely interchangeable. Any inner race will fit any roller assembly of the same piece number. This permits non-selective fitting after pre-assembling the two bearing parts in separable machine elements.

Interference fit of the inner race makes it virtually an integral part of the shaft. It requires no accessory device to hold it in place.

Straight cylindrical inner race permits lateral expansion of the shaft through the bearing in applications where this is an important consideration.

May be applied with the rollers operating directly upon the shaft to utilize larger shaft diameter or bearing of smaller size, thereby gaining greater shaft rigidity.

For more information about the "A-TS" and other Hy-Load Roller Bearings, write for your copy of Catalog 547. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J., Chicago, Detroit, Pittsburgh, and Oakland, Calif.



HYATT ROLLER BEARINGS

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

In designing the new Packard, body stylists made use of the best features of several popular models and threw in several of their own. The grille's top contour is still Packard

DETROIT

ALTHOUGH operations were throttled after assembly of only 1200 cars, Packard hoped to be moving again this week on its sleek 1951 models and to push production upward steadily toward a projected 13,000 per month. Plans call for a minimum of 100,000 by the end of next July and ample materials are in sight through the balance of this year. After that depends upon world events, the key factor of course being steel.

And the "400"—Expenditure for tooling the new line exceeded $15 million, most of this being for the completely restyled bodies which, incidentally, will be amortized over a two-year period, a practice now common throughout the industry. There are five basic body shells—two four-door sedans, a two-door sedan, a convertible and a "hardtop" that isn't in production yet. By varying the decorative treatment, these are expanded to nine body styles in three series of cars, the 200, 300 and 400 designations. The latter two are built in four-door sedans only, featuring a wide, wrap-around rear window. They will comprise only 20 per cent of total production, the balance being in the 200 series.

Three series of engines are used, all 8-cylinder L-head types. In the 200 model, engine develops 135 horsepower at 3600 rpm. Displacement is 288 cubic inches; compression ratio is 7:1. It has a five-bearing crankshaft. In the 300 model horsepower is 150 at 3600 rpm, displacement 327 cubic inches, compression ratio 7:1 and five main bearings. In the 400 model, horsepower is increased to 155 by stepping up the compression ratio to 7.8:1, displacement is 327 cubic inches and the crankshaft has nine main bearings. Optional high-compression heads are available on both the 200 and 300 series engines and are recommended for use with automatic transmission.

Familiar, Distinguishing Feature—In assessing the new body styling it might be observed that designers have made use of the best features of a number of popular models and used a few new ideas of their own. Overall height is lower by 2 inches, the hood is noticeably depressed to improve forward vision. Rear fenders have a straight-through sweep. Die-cast grille has a top contour suggestive of the familiar Packard radiator shell which has always been a distinguishing feature. Wheelbase of the 200 series has been increased 2 inches to 122, all of this space going into the engine compartment, probably in anticipation of a change to a new engine design in the 1952 models. Wheelbase on the 300 and 400 models also was increased to 127 inches. Weight of the smaller series has been reduced 100 pounds, of the larger types 150 pounds.

ASK THE MAN WHO OWNS ONE: Three 1951 Packard models feature a lower, fade-away hood, restyled fenders and greater glass area. The Patrician "400" (foreground) is the most luxurious of the line; it has flared rear fender design and chrome appointments. Center left is the "300" with wrap-around rear window and deluxe interior. In the right background is the "200," which features low-to-the-road styling for greater roadability and more interior room

All bodies are of the notch-back type, indicating that Packard stylists feel the so-called "streamline" body is a thing of the past. Principal deficiency of the streamlined body was the lack of headroom in the rear seat and restricted luggage space. The new designs also have greatly increased glass areas in windshield and rear window. Curved one-piece windshield has 958 square inches of glass and this, combined with wider and deeper rear windows, gives as much as 2½ times the glass area as in the 1950 models.

The Distaff Side—An innovation on the dashboard is a "vanity" drawer which rides on ball-bearing runners and pulls out for access, replacing the old glove box door which dropped down to open and ofter resulted in spilling the contents. First introduced by Nash last year, this idea likely will become standard throughout the industry.

Extensive use has been made of stainless steel molding and die-cast trim and ornaments, both inside and outside the new Packards. The stainless steel is not given a chrome flash, so it does not match exactly with the chrome-plated die-cast elements, but it's noticeable only on close inspection. Undoubtedly it permits appreciable savings on the cost of rolled moldings.

Stiff Lower Lip — A distinctive touch in front fenders is the sharp roll given to the lower edge around the wheel opening. The steel is practically curved back on itself, providing a considerable stiffening effect as well as enhancing the appearance. The operation is done on a special type of roll after press operations on the fender. These fenders are produced by Hayes Mfg. Co. in Grand Rapids and shipped to Packard in the white for finishing. Balance of the sheet metal work on the bodies, along with hoods, are furnished painted by Briggs in Detroit.

As yet Packard has no formal defense contracts. The company has been carrying out developmental assignments for the Navy and Air Force, though, and knows what to expect in the event of an all-out production effort on military equipment. Space and equipment are available to handle such work.

A Chrysler V-8 Engine?

Status of Chrysler's new V-8 overhead valve engine, once regarded as a certainty for 1951 Chrysler and possibly De Soto models, appears clouded at the moment. Production of De Soto bodies has begun in a new Warren avenue plant, relieving some of the pressure on facilities at the Chrysler Jefferson plant where the new engine will be built, but it appears doubtful if equipment installations can be readied to have the unit in production by the latter part of the year.

The engine has been in process of

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engineering development for several years, and has gone through numerous modifications. Basically, it is the familiar V-type plant, beefed up to handle higher compression ratios and with overhead valve arrangement. Spark plugs are positioned squarely over the center of the cylinder bores. The idea is to get an improved firing action. Quotations on production equipment have been in process of figuring and refiguring for many months. There is, of course, no official comment from company sources as to any production timetable, or even that such an engine is nearing production.

A new engine-building project takes time and money, principally because of the machine tool equipment involved. An outlay of $10 to $15 million dollars is often just a starter in setting up facilities to produce 40 or 50 engines an hour. Thus it is not difficult to see why a manufacturer moves slowly and cautiously in the development of radically changed engines. Even a slight mistake can prove to be a rough financial blow.

Dodge Gets Mail Truck Order

Dodge announced receipt of a $5.5 million contract for 3750 special mail trucks to replace obsolete models in the Postoffice Department. It is the latest of four contracts: Total Dodge mail truck orders over the past 18 months rose to 5921. First order was signed in January, 1949. It called for 1200 integral cab and body type trucks costing $2.5 million. Bodies are mounted on a 1½-ton chassis. The second purchase, June, 1949, called for 571 van-type trucks valued at $1,750,000. These have a 2¾ ton chassis. Third contract covered 400 half-ton standard panel trucks, costing $500,000. The latest group of trucks will have special bodies mounted on standard 1-ton chassis, and will be completely insulated.

Brake the Car with One Finger

New parking brake now being installed on Chrysler passenger cars can be operated by the pull of a single finger and will hold a full-loaded sedan with gross weight of 6200 pounds from rolling backward on a 32 per cent grade. The brake is mounted on the propeller shaft, completely independent of wheel brakes, and is of the internal-expanding type, providing more than three times the maximum braking effect of the external-contracting type which it replaces. When the brake is engaged, both brake shoes become self-energized to utilize the motion of the car in multiplying braking action. It is fully enclosed to keep out dirt and oil, and lining material is mounted by the cyclebond process, dispensing with the need for rivets.

Hudson, Nash New Models

Hudson closed for changeover to 1951 models and expects to be rolling by Sept. 5, after two weeks of idleness, for equipment rearrangement, inventory and other details. Nash resumed operations last week at its Wisconsin plants on the 1951 versions of its Statesman and Ambassador models. They will be displayed publicly Sept. 22; details are being withheld until that time. Changes will be centered principally in a revised styling of the front grille, larger and higher rear fenders, along with the usual modifications in trim detail. No changes are contemplated in Nash Rambler models, although additional body styles in the latter series are expected before the end of the year.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
May	732,161	508,101
June	897,864	523,689
Six Months	3,941,883	3,034,055
July	751,300*	604,351
August		678,092
September		657,073
October		601,021
November		474,731
December		384,318
Total		6,533,641

Weekly Estimates

Week Ended	1950	1949
Aug. 5	175,572	145,596
Aug. 12	182,965	146,317
Aug. 19	192,511	149,359
Aug. 26	195,000	155,367

Estimates by Ward's Automotive Reports

* Preliminary.

Ford's Retirement Plan Approved

Ford received Treasury Department approval of an improved retirement plan for salaried employees and for hourly employees not covered by the UAW-CIO retirement plan. All employees are covered by provisions for a basic noncontributory benefit, amounting to $100 monthly, including primary federal social security, at normal retirement age of 65 after 30 years of credited service. Employees with two years of service earning salaries in excess of $300 monthly have an opportunity to build up additional benefits on a contributory basis. Contributions are 5 per cent of salary over $300 a month and the annual retirement benefit is equal to 30 per cent of total contributions over the years, in addition to the basic benefit. An example: An employee who contributed an average of $150 a year for 30 years would, on retirement at age 65, be entitled to $1350 per year from the contributory portion of the retirement plan and another $1200 a year from noncontributory portion.

Suggestions Worth $250,000

Buick paid out more than $250,000 to employees for suggestions that reduced manufacturing costs over the past eight years. In the last 30 days alone, 129 employees were awarded $7455 in cash and savings bonds. Top award of $1000 went to a diemaker who suggested a new way of handling rear fenders, saving 24 cents per car.

Safe Workers

Employees in the Ford blooming and billet mills are sporting new cigaret lighters, awarded to them by the company when the mills passed the 1 million man-hour mark without a lost-time accident.

Seiberling Jacks Up Prices

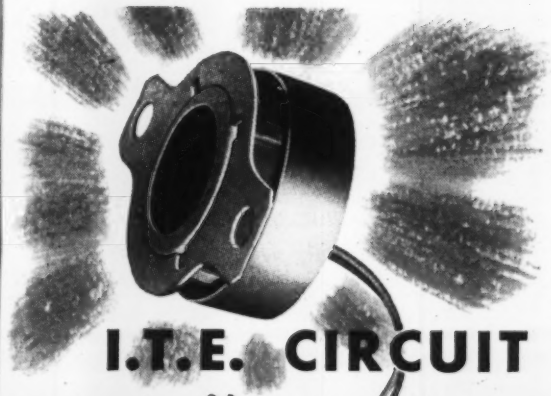
Seiberling Rubber Co. says higher material costs forced it to increase quotations on some of its tire lines. The action brought Seiberling's prices in line with those of other major producers who have been announcing tire increases all along.

J. P. Seiberling, president of the company, warns that the decline in the crude rubber market last week will not mean lower tire prices for some time to come. The reason: Tire manufacturers buy their rubber months in advance for later delivery.

Willys Plant Going Great

The Maywood, Calif., plant of Willys-Overland Motors, which assembles station wagons, trucks, Jeepsters and Jeeps for West Coast buyers, reports its July production was higher than any month since the plant began postwar production in October, 1947.

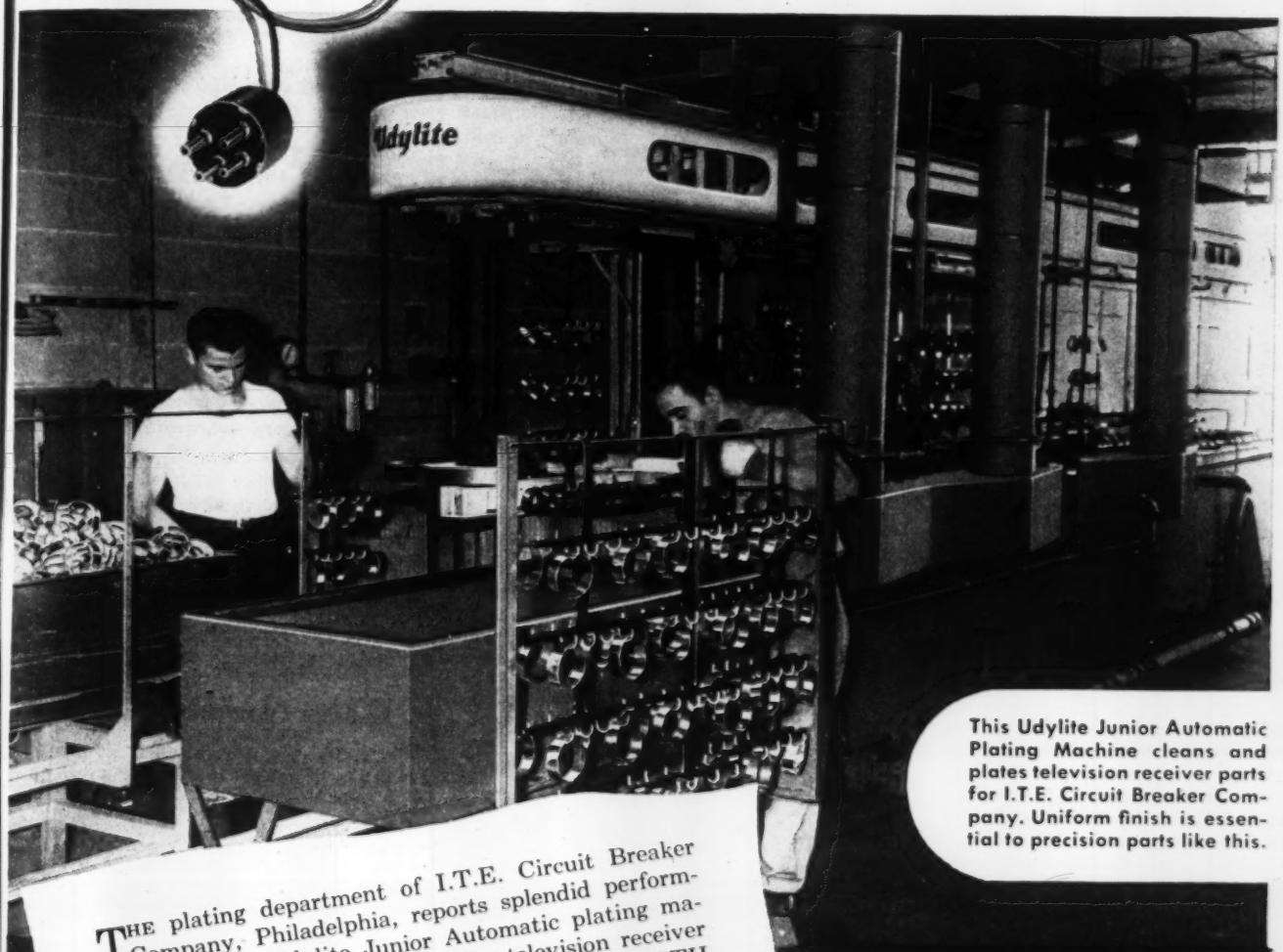
Vehicles distributed from the Maywood plant included nearly 50 per cent of the 4-wheel drive models. The models are particularly popular in the West because of the positive traction afforded on difficult terrain.



Udylite JUNIOR AUTOMATIC

gives increased production... more uniform plating for

I.T.E. CIRCUIT BREAKER COMPANY



This Udylite Junior Automatic Plating Machine cleans and plates television receiver parts for I.T.E. Circuit Breaker Company. Uniform finish is essential to precision parts like this.

THE plating department of I.T.E. Circuit Breaker Company, Philadelphia, reports splendid performance by their Udylite Junior Automatic plating machine. Used primarily for finishing television receiver components—this Udylite unit incorporates BOTH cleaning and plating in ONE operation. The results are: greater quantity and improved quality of production with lower direct labor costs.

This is typical of the results gained by Udylite customers. In virtually every case they report that Udylite plating equipment and processes give them both cost reduction and increased quality of plating. You can reap these same rewards with Udylite. Call in your Udylite Technical Man and let him analyze your operation and make recommendations for bigger plating profits for you. Or write direct to the Udylite Corporation, Detroit 11, Michigan. There's no obligation.

THE

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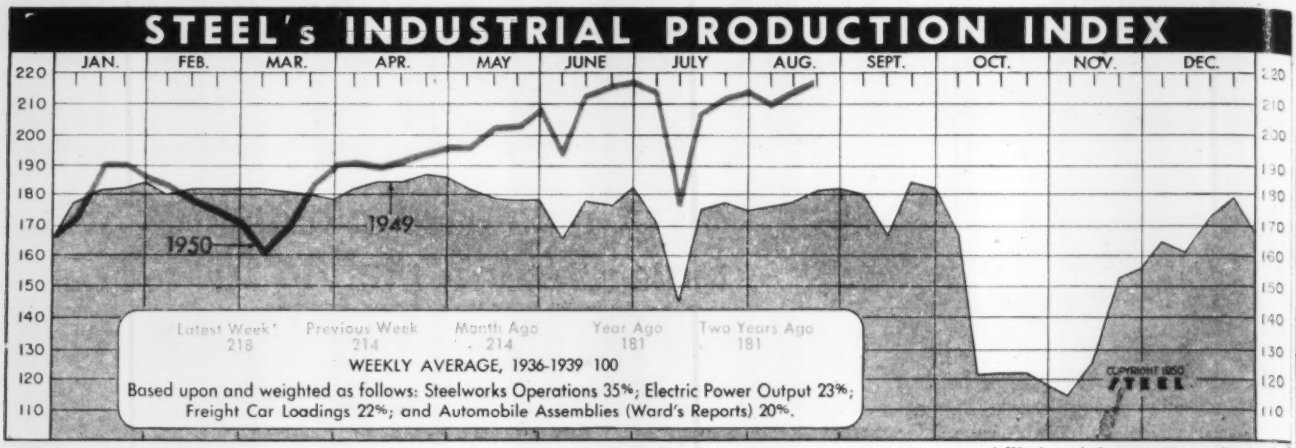
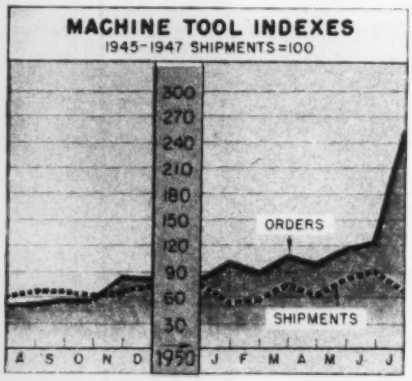


* Week ended Aug. 19 (preliminary)

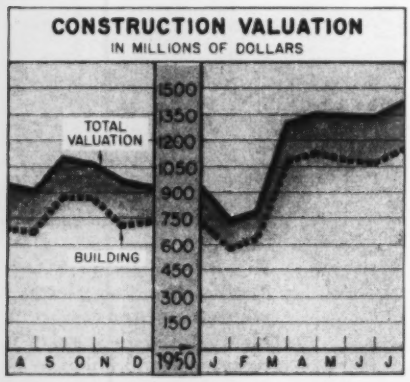


Charts—Copyright 1950, STEEL

Machine Tool Indexes

	New Orders		Shipments	
	1950	1949	1950	1949
Jan.	99.7	87.0	52.4	68.8
Feb.	89.2	80.9	56.1	70.3
Mar.	107.4	93.5	75.3	75.8
Apr.	98.9	70.1	61.6	74.7
May	116.4	63.7	82.5	72.8
June	126.2	53.6	90.4	79.0
July	253.3	48.0	67.8	60.7
Aug.	....	51.5	...	67.3
Sept.	....	57.7	...	67.6
Oct.	....	56.8	...	62.3
Nov.	....	84.3	...	67.6
Dec.	....	82.5	...	75.7

National Machine Tool Builders' Assoc.

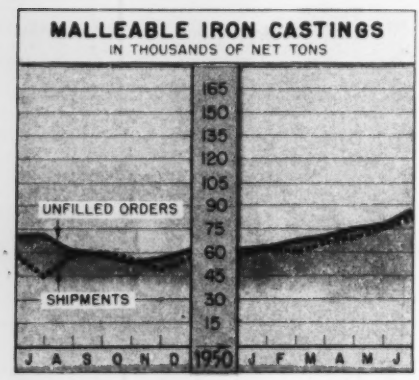


Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1950	1949	1950	1949
Jan.	730.9	483.0	578.8	381.0
Feb.	779.5	568.5	627.0	415.0
Mar.	1,300.2	747.6	1,075.3	579.2
Apr.	1,350.5	842.6	1,123.5	620.2
May	1,347.6	880.3	1,083.0	666.9
June	1,345.5	945.7	1,072.0	706.7
July	1,420.2	943.6	1,162.2	690.9
Aug.	....	905.7	....	671.5
Sept.	....	1,093.7	....	870.6
Oct.	....	1,061.8	....	857.8
Nov.	....	957.8	....	701.3
Dec.	....	929.0	....	722.2
Total	....	10,359.3	...	7,883.3

F. W. Dodge Corp.



Malleable Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1950	1949	1950	1949
Jan.	62.9	71.9	62	126
Feb.	60.4	66.7	67	118
Mar.	66.3	72.1	70	102
Apr.	69.8	61.3	76	95
May	76.2	54.6	77	79
June	82.3	59.6	87	70
July	...	44.4	..	71
Aug.	...	58.1	..	61
Sept.	...	60.5	..	58
Oct.	...	57.2	..	54
Nov.	...	49.4	..	56
Dec.	...	57.4	..	61
Total	...	713.1		

* For sale. Bureau of the Census

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Employ., Metalwkg. Aug.21	Gray Iron Cast. Aug.7	Refrigerators Aug.21
Employ., Steel Aug.21	Indus. Prod. Aug.7	Steel Castings Aug.21
Fab. Struc. Steel Aug.7	Ironers Aug.21	Steel Forgings Aug.7
Foundry Equip. Aug.7	Price Indexes July31	Trucks, Elec. Ind. Jan.2
Freight Cars Aug.14	Pump Orders Aug.14	Vacuum Cleaners July31
Furnaces, W. Air Aug.14	Purchasing Power July31	Wages, Metalwkg. Aug.21
Furnaces, Indus. Aug.14	Radio, TV Aug.14	Washers Aug14
Gear Sales Aug.7	Ranges, Gas. July10	Water Heaters July10

Machine Tool Orders Zoom

July's new orders for machine tools were placed at a pace reminiscent of the war years. The National Machine Tool Builders' Association Index skyrocketed to 253.3, highest figure since March, 1943. This illustrates again machine tools are a feast or famine business; just one year earlier the index was down to 48, the postwar low.

Domestic customers propelled the index to its seven-year high. The foreign orders index dropped 1 point to 22 in July from 23 in June. The shipments index slipped to 68 in July from 91.9 a month earlier because of plant closings for vacations. Lower shipments and a high new orders index combined to push July's ratio of unfilled orders to shipments to 7.6 to 1, compared with 5.0 to 1 a month earlier.

Another Construction Record Set

Construction contract awards in the 37 states east of the Rockies again reached an alltime high. The July total was $1420 million and was 5 per cent higher than the previous record set in April this year.

Latest total was 6 per cent higher than June's $1345 million and 51 per cent higher than the July, 1949, total. Total awards for the first seven months are $8274 million, 53 per cent greater than the year ago figure. They are equal to 753.7 million square feet of floor area, 69 per cent increase over the comparable figure for 1949.

Residential awards in July were up 7 per cent over June and 98 per cent over the like year ago figure. They totaled $675 million. Nonresidential awards were $487 million, up 10 per cent over the June total and 39 per cent over July, 1949.

Public and private works and utilities decreased 6 per cent from June's total to almost $258 million.

The Business Trend

Relentless pressure for metalworking's products continues even after the first flurry of panic buying has subsided. Backlogs grow despite high output

A PRESSURIZED quiet pervades the business picture. Some of the frenzied scrambling to buy anything and everything that might become scarce has subsided but metal products are still sought avidly. Metalworking and metalproducing companies report backlogs are higher than they have been in a long time and orders continue to pour in both for capital goods and consumer items. Price pressures are generally up. There is a little easing in some lines but here again metalworking is not affected. Both ferrous and nonferrous metals are tight and prices are trending upward. Lines in which there was some weakness a few months ago have firmed up and in a number of instances price cuts instituted earlier this year have been rescinded. To date major steel producers are holding the price line but smaller companies were forced "to make strategic withdrawals on a fluid price front" and pushed their prices up a notch.

Few metalworking companies can say they are getting all the steel they need but output is high. It is impossible for many of them to keep pace with demand despite output at high levels.

In the week ended Aug. 19 STEEL's industrial production index advanced 4 points to a preliminary 218 per cent of the 1936-1939 average. The latest index is only 1 point below the alltime high attained in mid-June, indicating the rapidity of industry's productive pace.

Squeeze in Autos . . .

Materials shortages are hampering automobile and truck production despite an assembly rate which is higher than any attained prior to this year. Automakers are unable to reach the record output totals set in June. Labor unrest brought about by the rising cost of living is another specter in the wings. Attempts are being made to reopen contracts for wage talks in order to get wage raises before a possible government ordered wage freeze. In the week ended Aug. 19 outturn totaled 192,511 passenger cars and trucks. This brought the total for the year to 5,219,000 units, compared with 4,193,000 in the like period a year ago.

Steel Rate Slips . . .

Last week the steelmaking rate slipped from the 100 per cent attained in the week ended Aug. 19 as token strikes by branch railroads serving midwestern steel centers put a crimp in output. Customers served by the steel companies affected by the latest labor disturbance will be a little harder pressed to maintain their production schedules.

Dividends Rise . . .

Cash dividends by U. S. corporations issuing public reports amounted to $892.1 million in June and $509.4 million in July. Commerce Department says the total for the two months is 8 per cent higher than in the same months last year. Minor declines from 1949 were recorded for mining and railroad corporations. In the latter case June-July dividend disbursements represent appreciable im-

BAROMETERS of BUSINESS

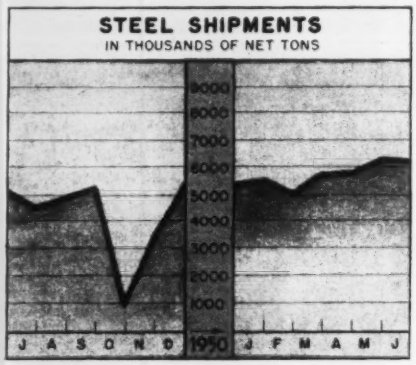
		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	100.0	99.5	99.0	83.5
	Electric Power Distributed (million kilowatt hours)	6,370	6,253	6,186	5,578
	Bituminous Coal Production (daily av.—1000 tons)	1,803	1,760	1,550	1,328
	Petroleum Production (daily av.—1000 bbl)	5,708	5,674	5,537	4,775
	Construction Volume (ENR—Unit $1,000,000)	$250.1	$164.0	$343.3	$137.2
	Automobile and Truck Output (Ward's—number units)	192,511	182,965	187,339	149,359
	*Dates on request. † 1950 weekly capacity is 1,926,803 net tons. 1949 weekly capacity was 1,843,516 net tons.				
TRADE	Freight Car Loadings (unit—1000 cars)	845†	847	830	731
	Business Failures (Dun & Bradstreet, number)	186	194	170	193
	Money in Circulation (in millions of dollars)‡	$26,976	$27,015	$27,029	$27,383
	Department Store Sales (changes from like wk. a yr. ago)‡	+26%	+30%	+25%	−15%
	† Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,316	$13,671	$15,096	$12,640
	Federal Gross Debt (billions)	$257.6	$257.4	$257.2	$254.9
	Bond Volume, NYSE (millions)	$19.7	$19.3	$28.9	$16.1
	Stocks Sales, NYSE (thousands of shares)	8,323	9,335	11,744	5,020
	Loans and Investments (billions)†	$67.9	$67.8	$67.6	$64.2
	United States Gov't. Obligations Held (millions) †	$35,154	$35,496	$36,248	$36,144
	† Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	156.99	156.99	156.69	152.52
	STEEL's Nonferrous Metal Price Index‡	200.2	197.0	192.1	180.1
	All Commodities†	165.0	165.6	163.3	152.7
	Metals and Metal Products†	174.2	173.9	173.3	168.2
	† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100. †† 1935-1939=100.				

Durable Goods Orders, Sales

In Millions of Dollars

	New Orders		Sales*	
	1950	1949	1950	1949
Jan.	8,377	6,706	7,471	7,550
Feb.	7,513	6,734	7,461	7,757
Mar.	9,075	7,185	8,127	7,805
Apr.	8,531	6,127	7,956	7,445
May	8,909	5,993	9,089	7,488
June	10,665	6,544	9,550	7,745
July	....	6,195	....	7,207
Aug.	....	7,407	....	7,982
Sept.	....	7,634	....	7,877
Oct.	....	7,432	....	6,542
Nov.	....	7,402	....	7,041
Dec.	....	7,019	....	6,960

* Seasonally adjusted. U. S. Office of Business Economics

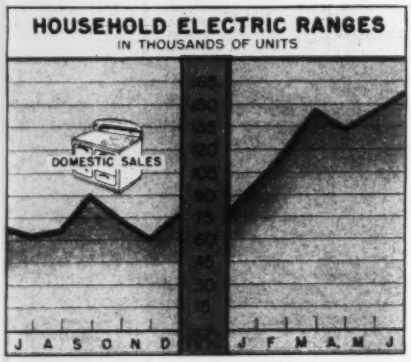


Steel Shipments

Net Tons

	1950	1949	1948
Jan.	5,482,691	5,788,632	5,410,438
Feb.	5,134,780	5,519,938	5,046,115
Mar.	5,723,340	6,305,681	5,978,551
Apr.	5,780,453	5,596,786	5,096,161
May	6,252,642	5,234,862	5,321,375
June	6,192,438	5,177,259	5,476,774
July	.....	4,534,855	5,229,880
Aug.	.....	4,918,314	5,329,060
Sept.	.....	5,236,196	5,511,474
Oct.	.....	935,037	5,952,008
Nov.	.....	3,296,809	5,732,256
Dec.	.....	5,410,902	6,056,282

American Iron & Steel Institute



Household Electric Ranges

Domestic Sales—Units

	1950	1949	1948
Jan.	97,925	106,473	103,585
Feb.	118,989	87,370	103,506
Mar.	145,417	87,543	127,461
Apr.	132,859	59,894	104,677
May	144,093	52,286	98,983
June	158,534	68,107	123,300
July	.....	62,402	83,485
Aug.	.....	66,222	116,107
Sept.	.....	91,073	128,829
Oct.	.....	72,672	122,516
Nov.	.....	60,523	123,661
Dec.	.....	77,011	105,387
Total	.....	903,806	1,341,497

National Electrical Mfrs. Assoc.

Charts—Copyright, 1950, STEEL

provement over the first five months. Within manufacturing there was some variation among the sub-groups. Highest increases were in iron and steel and the automobile industries. Automotive dividend rates are a continuation of a higher 1950 level compared with 1949. In iron and steel the rate for the first five months this year was about equal to a year ago but in June-July it was one-fifth higher. Most other manufacturing subdivisions exceeded their 1949 payments in June and July this year.

FRB Index Stays Up . . .

Federal Reserve Board says industrial production in July maintained the record peacetime pace it reached in June. The board's estimate of July's index is 199, matching the high attained a month earlier. A year earlier it was 161 and the monthly average in 1949 was 176. Effects of the Korean war did not have time to make themselves felt for the most part in July production, the board reports.

Construction Revives . . .

Slump in engineering contract awards was broken in the week ended Aug. 17 with a volume of more than $250 million. Mass housing moved up to $80.8 million, industrial building to $50 million, highways to $30.8 million and commercial building to $26 million. The latest week compares with a weekly average of $226 million to date this year and $137 million in the corresponding week last year.

Motor Industry Overloaded

Better anticipate your motor needs. Growing backlogs have extended deliveries recently

PLANNING to buy electric motors? If you are then don't put off getting your order in until a few weeks before you need motors. Deliveries are far more extended than they were a couple of months ago and the current pace of orders being placed means deliveries will be extended for some time.

There is no need for panic but some forehandedness will save a lot of headaches. A few "garden variety" motors are still in stock but the supply is limited. Others may be available in as little as eight weeks but in the majority of cases, particularly in smaller-size integral horsepower alternating current motors the delay will be much longer.

Salesmen's Promises—Motor buyers report salesmen tell them they can expect a 9 to 12 week delay in deliveries on popular sizes of ac motors. In the words of one motor company's sales manager: "That's an overly optimistic statement; deliveries on smaller integral motors actually are extended to around 18 weeks." Some larger ac motors run around 12 weeks for delivery. Specially engineered motors with accompanying controls take about 36 weeks from the time the order is placed until delivery can be made.

Normally when pressure for motors increases there is an orderly progression by size of motors in tight supply. The sequence is: Fractional horsepower, small integrals, big integrals and finally synchronous motors. Currently, the first two classifications are in great demand and pressure is mounting for the larger integral motors.

Escalators in Fashion—Practically all motor builders are using an escalator clause with a 10 per cent ceiling. Buyer has to pay the price in effect at the time motor is shipped but the increase cannot be more than 10 per cent higher than the price in effect at the time the order was placed on the motor maker's books. This action follows a 10 per cent price rise put in effect between July 15 and 31 by all major producers.

Steel and copper are the materials in tightest supply for motor makers. Shortage in copper is attributed to government stockpiling, curtailed imports from Chile due to an unsettled tariff situation and war-induced

panic copper buying. Aluminum is no problem since a relatively small amount goes into each motor usually for fans or ac rotors. Castings for motor frames are in good supply.

Enough Manpower Now—Enough skilled and unskilled workers are available to sustain motor output at the current pace but several manufacturers hastily add "right now that's true but the situation may change rapidly." Possible loss of employees to the armed forces has already prompted several companies to investigate using older workers and more women in assembly operations. Several companies had recall lists of employees that had been laid off but these lists are pretty well used up and they will have to seek additional help in the open market.

Industrial Supplies Active

Business in industrial supplies this month is the most active for manufacturers and distributors since the last war and prices are inching upward.

Typical examples: One manufacturer of pipe tools is operating overtime six days a week, as is a maker of bench vises. A third plant is running 12 hours a day on gages. At the moment, there is a reluctance to add and train workers for extra shifts since present scare buying is not expected to be sustained.

Price increases ranging from 5 to 15 per cent have been made on coated abrasives, wrenches, pipe threading and cutting tools, carbon steel taps, end mills and similar products. Grinding wheels, high speed drills and files went up earlier this year. At present, high speed taps are not expected to go up along with carbon steel taps due to a competitive situation.

Current increases so far have not been across the board among all mill supply items and manufacturers. But, these irregularities will be leveled out by higher prices in the making over the next few weeks.

White Already Tops '49 Earnings

Second half earnings should be as good as they were in the first six months, says Robert F. Black, White Motor Co. president. The Cleveland truck building company's first half earnings were considerably ahead of those for all last year. Manufacturing economies made possible by capital expenditures for tools and equipment have begun to pay off and the company has a better control of distribution costs.

GNP Reaches New High

Improving business pushes second quarter total $3.1 billion higher than previous record

BUSINESS didn't need any shot in the arm from the Korean War. Gross national product in the second quarter was at an annual rate of $269.9 billion, the Commerce Department reports. This often consulted gage of the nation's economic well being set a new record for the latest reported period. It not only rose $7 billion from the level attained in the first quarter but surpassed the previous high of $266.8 billion set in 1948's fourth quarter.

Commerce says the second quarter advance was an extension of the upswing in economic activity under way earlier this year. This improvement still has many economists talking to themselves as they try to explain what happened to punch holes in their scientific reasoning. Chart shows GNP quarterly totals at annual rates for 1948-1949 and the first two quarters this year.

Reasons Why—Personal consumption expenditures rose to $184.5 billion at seasonally adjusted annual rates, as compared with $182.5 billion in the first quarter and $180.5 billion at the end of last year. Price increases accompanied the latest expenditures and reflected little change in physical volume.

Principal factors stimulating advances in consumer purchases have been the higher income generated by expanding economic activity and the receipt of insurance dividends by veterans. The second quarter increase was concentrated in nondurable goods, mainly clothing and food, with consumer expenditures for services also contributing. Durable outlays continued to absorb an extraordinary portion of the consumers' dollar but the gain was slight because first quarter level was very high. Further increases in automobile buying were offset by some slackening in furniture and household equipment purchases.

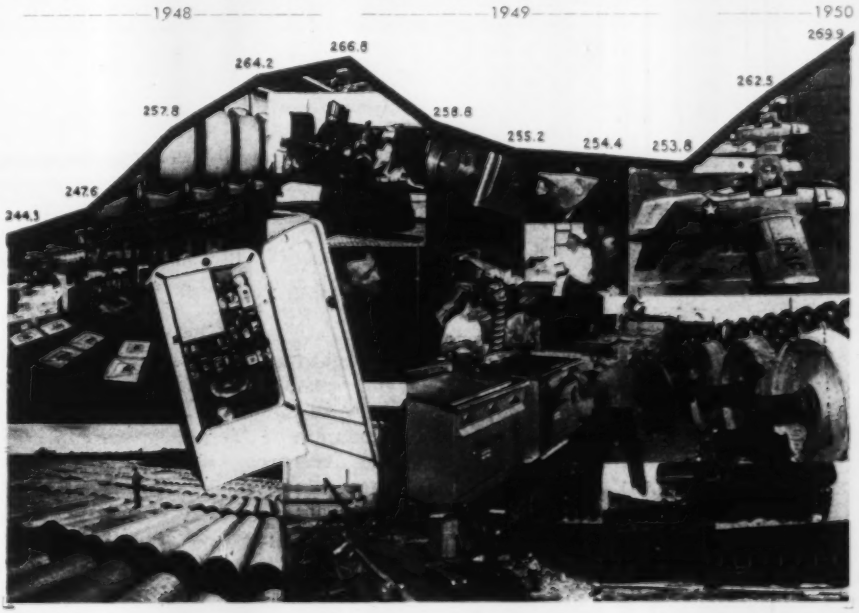
Expanding Investment—Gross private domestic investment moved forward by more than $5 billion in the second quarter to a $46 billion annual rate. Business purchases of durable equipment expanded by $2 billion after a moderate recovery in the first quarter had reversed 1949's decline. Inventory accumulation at $3.5 billion annual rate was $2 billion greater than in the first quarter. The building boom added another $1 billion to the rise.

Net foreign investment remained stable in the June quarter at a negative balance amounting to about $2 billion at an annual rate, permitting foreign countries as a whole to effect further improvement of their financial position in relationship to this country.

Government purchases of goods and services in the second quarter were at a $41.5 billion annual rate, unchanged from the first three months. Federal expenditures will rise in the second half as a direct result of the Korean War. Further rise in gross national product in the third and fourth quarters is a virtual certainty because of the high rate of business activity for civilian uses and the added boost of a rearmament program.

Gross National Product at New Peak

(In Billions of Dollars at Annual Rates)



Men of Industry

HOWARD H. WILDER
. . . Vanadium mgr., Iron Foundry Div.

Howard H. Wilder was appointed manager, Iron Foundry Division, **Vanadium Corp. of America,** with headquarters in Detroit. He succeeds the late **R. G. McElwee.** Mr. Wilder was formerly chief metallurgist of the Eaton Mfg. Co.'s foundry division at Vassar, Mich.

Pittsburgh Steel Co., Pittsburgh, appointed **Fuller McCowan** as assistant advertising manager. Mr. McCowan has been with Pittsburgh Steel Products Co. in sales promotion work.

Appointment of **Roger S. Ahlbrandt** to the newly created position of manager of stainless steel bar sales has been announced by **Allegheny Ludlum Steel Corp.,** Pittsburgh. He has been assistant manager, cutting tool sales. **I. R. Leheny,** sales manager of the San Francisco district office, succeeds Mr. Ahlbrandt, and is in turn succeeded by **Guy M. Winton.**

Walter B. Baisch was elected vice president in charge of operations, **Michigan Seamless Tube Co.,** South Lyon, Mich.

Carl E. Allen was elected president and a director of **Campbell, Wyant & Cannon Foundry Co.,** Muskegon, Mich. He will assume his new duties Sept. 16 following retirement of **Ira A. Wyant** from that position. Mr. Wyant, one of the founders of the company, will continue as a director. Mr. Allen has been connected with National City Bank of New York, where since 1940 he has been a vice president. In recent years he supervised the bank's business in the eastern part of the country including Michigan.

R. GRAHAM HOLABIRD
. . . mgr. of new region, National Electric

National Electric Products Corp., Pittsburgh, has created within its sales organization a western region and has named **R. Graham Holabird** regional manager. The regional office is in San Francisco. Mr. Holabird has been manager of the San Francisco sales office. Three district sales managers reporting to Mr. Holabird in the newly consolidated western region are: **N. L. Bost** as manager of the northwest district with headquarters in Seattle; **R. E. Stone,** as manager of the southwest district, Los Angeles; and **W. D. Ross,** now San Francisco district manager.

Paul C. Sandmeyer was appointed vice president, **Stainless Steel Sales Corp.,** Philadelphia, which he joined in 1948. He previously served in various capacities with Pittsburgh Steel Co., Jessop Steel Co., and for a period of 15 years was associated with Carnegie-Illinois Steel Corp.

Solar Steel Corp., recently purchaser of Miller Steel Sales Inc., Philadelphia, has appointed **R. Mason Scheetz** as manager of the Solar Steel Philadelphia Division. Mr. Sheetz became executive vice president of Miller Steel Sales in 1948, continuing in that position until accepting this key post.

Dr. E. W. Volkmann was assigned responsibility for the laboratory and development sections of the research department of **Koppers Co. Inc.,** Pittsburgh. **Dr. F. L. Jones** will supervise the research administration and patents sections of that department. **Dr. W. J. Monacelli,** recently named acting manager of the patents section, was named manager of that section.

FRANK T. WRUK
. . . V. P.-sales and service at Peerless

Peerless Machine Co., Racine, Wis., elected **Frank T. Wruk** vice president in charge of sales and service. Early in his association with Peerless, which he joined in 1920, Mr. Wruk was employed in the research department where he contributed to the development of the Peerless metal cutting machines. He later was promoted to assistant works manager, and more recently has devoted his time to sales engineering and service.

Edward J. Sherrill was appointed sales manager of pig iron, **Ore Trading Corp.,** New York, importer of pig iron, open-hearth ores and manganese ores. He was previously assistant general superintendent, Jessop Steel Co., Washington, Pa., and prior to that superintendent of production scheduling, Wickwire Spencer Steel Co., Buffalo, for 20 years.

Albert L. Gutterson was elected president, **Lovejoy Tool Co. Inc.,** Springfield, Vt. He was formerly associated with Fellows Gear Shaper Co. and later with Jones & Lamson Machine Co. in the shop and engineering departments. At one time he was sales engineer with the latter company. For the last few years he has acted as manufacturers' agent in Vermont and New Hampshire for concerns manufacturing equipment used by the petroleum industry. **George A. Perry** was elected a director of Lovejoy Tool Co., succeeding the late **Charles N. Safford,** who was president and a director.

Leonard E. Bees was appointed vice president in charge of manufacturing of **Trumbull Electric Mfg. Co.,** Plainville, Conn. In this position Mr. Bees

Is PHYSICAL STRENGTH your magnet problem?

Mills agree that skull-cracking subjects a magnet to the roughest of service. Cautioning crane operators to "take it easy" is sage but frequently impractical advice.

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Ohio MAGNETS

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is responsible for formulation of manufacturing policies and conduct of all activities directly related to the manufacturing, packing and shipping of company products at all company locations.

Royal Metal Mfg. Co. promoted **J. B. Proctor,** sales manager of DeLuxe Metal Furniture Co., Warren, Pa., to the position of general manager. DeLuxe, producer of steel shelving and cabinets, recently was purchased by Royal Metal.

Appointment of **Edward W. Addis** to its sales staff was announced by **Gordon & Kinney Inc.,** Detroit, representative for Automatic Transportation Co., Chicago. He has been sales manager of Rowe Methods Inc.

T. J. Crocker, assistant manager, was appointed acting manager of **Bethlehem Coal Mines,** Bethlehem Steel Co., Bethlehem, Pa., during the absence of **K. M. Quickel,** present manager.

D. C. Wedlick was appointed district sales engineer in the Muncie-Anderson, Ind., area by **Michigan Tool Co.** His headquarters will be in Muncie.

W. H. Schneider was elected vice president-comptroller, **Mack Trucks Inc.,** New York. He succeeds **J. E. Savacool,** retiring, but who will be retained as an executive consultant on financial matters.

Emile F. Sanford Sr., Memphis, Tenn., was appointed an assistant special representative for **Willys-Overland Motors Inc.** in Tennessee, Alabama, Louisiana, Mississippi and Arkansas.

Crouse-Hinds Co., Syracuse, N. Y., elected **Albert F. Hills** executive vice president; **F. Ware Clary,** vice president in charge of publicity; and **Carl H. Bissell,** vice president in charge of engineering.

Promotions at **Bates Expanded Steel Corp.,** East Chicago, Ind., include **Robert G. Robey,** formerly assistant to the executive vice president, as vice president, and **Alex Russell,** formerly assistant treasurer, as treasurer.

Vernon R. Childress joined the marketing division, chemical department, **General Electric Co.,** Pittsfield, Mass. Named to key assignments in the apparatus department are **M. L. Hurni** as staff assistant, large apparatus divisions, and **Hershner Cross,** staff assistant, small apparatus divisions. **Edward A. Green** was appointed staff assistant to the general sales manager, small apparatus divisions, with headquarters at Lynn, Mass. He is succeeded as manager of sales, control divisions, by **L. Dean Fowler.** Formerly manager of the San Jose, Calif., motor sales division, small and medium motor divisions, Mr. Fowler will now be located at Schenectady, N. Y.

Robert M. Norton, until recently assistant sales manager, was promoted to sales manager, **Hanson-Van Winkle-Munning Co.,** Matawan, N. J. He will continue to direct the sale of electroplating and polishing supplies and in addition will assist **John A. Bauer,** vice president, with general administrative problems.

John J. O'Farrell was named management engineer in charge of methods engineering, inventory control and I.B.M. departments for **Hyster Co.,**

JOHN J. O'FARRELL
. . . management engineer at Hyster

Portland, Oreg. Working under Mr. O'Farrell are **Sherman D. Bucher,** supervisor of inventory control department; and **Leland R. Viar,** supervisor of the methods engineering department. **Kirk Lowe** was appointed pressed metals engineer in the manufacturing engineering department, and **Robert M. Remmen** is now in charge of subcontracting. **Harold R. Lucas Jr.** was appointed assistant to the general sales manager. **Henry Benit** was named assistant to **Richard Stiegele,** and will be in charge of demonstrations of the Hyster grid roller.

Hyatt Bearings Division, Harrison, N. J., General Motors Corp., promoted **Alton H. Lundius** as works manager of all manufacturing and service operations at the Harrison and Clark township plants; **Robert R. Guempel** as plant manager, Clark township plant; **William H. Chapman** as director of engineering to co-ordinate machine and product design, research and application engineering; **Martin A. Moore** as administrative assistant to the general manager; and **David B. Caminez** as divisional comptroller.

Joseph Varacalli was named dealer sales supervisor for **Allis-Chalmers Mfg. Co.'s** Empire region, with headquarters in New York, to succeed **J. R. Queen,** resigned. Mr. Queen joined Columbia Machine & Engineering Co., Hamilton, O. **Richard M. Friddle** and **Richard A. Frazee** were assigned to Allis-Chalmers' Cleveland and St. Louis district offices, respectively, as sales representatives, and **Carl R. Froeba** was named a sales representative in the Atlanta district office. **Ernest C. Shaw,** consulting engineer, wood processing machinery section, retired after more than 47 years' service.

Blaine F. Fairless was promoted to sales manager, **Steel City Electric Co.,** Pittsburgh.

D. Gray Weaver, formerly in the product development laboratory of **Acheson Colloids Corp.** at Port Huron, Mich., was transferred to the Newark, N. J., office to assist in co-ordinating of technical and research problems involving Acheson Colloids Corp. and Acheson Colloids Ltd. of London.

National Radiator Co., Johnstown, Pa., has opened a Pacific branch sales office in San Francisco with **Robert E. Daly** as branch manager. **Herbert Van Kuran** joined the Pacific branch sales staff to succeed Mr. Daly as northwest sales representative, with offices in Seattle.

Milton L. Weislogel was promoted as assistant to general superintendent, Gary, Ind., steel works, **Carnegie-Illinois Steel Corp.,** subsidiary, U. S. Steel Corp. **Frank A. Kelly** succeeds Mr. Weislogel as plant industrial engineer.

Charles H. Gallaway, sales manager, safety products division, American Optical Co., Southbridge, Mass., was elected president, **Industrial Safety Equipment Association.** He succeeds **Lawrence E. Dickson,** president of Standard Safety Equipment Co., Chicago. **E. L. Wheeler,** Wheeler Protective Apparel Inc., Chicago, was elected vice president to succeed Mr. Gallaway.

Floyd Monteith was appointed representative working out of the Chicago office for **Kennametal Inc.,** La-

trobe, Pa. **Robert Karakoosh** will work out of the Springfield, Ill., office.

E. H. **Lamberger** was appointed assistant to the manager of the patent department, **Westinghouse Electric Corp.**, Pittsburgh. **Fred S. McCarthy** was appointed sales promotion manager for Westinghouse's Television and Radio Division.

A. B. **Vestal,** assistant to the president, Firth-Sterling Steel & Carbide Corp., McKeesport, Pa., has left that position to join the staff of **Edwards & Barnes,** management consultant, Pittsburgh.

Roger A. Yoder, secretary and treasurer, Detroit Steel Corp., was elected president of the Detroit Control of the **Controllers Institute.** At the same meeting **Luther E. Lawrence,** assistant treasurer and comptroller, McLouth Steel Corp., and **Harry J. Longway,** secretary-treasurer-controller, Michigan Steel Products Co., both of Detroit, were chosen directors. New president of the Hamilton, Ont., Control of the institute is **Stanley E. LeBrocq,** comptroller of Steel Co. of Canada Ltd. **M. S. Southerland,** controller, Burlington Steel Co. Ltd., was renamed treasurer.

Andrew Liston, is the newly appointed manager, hydraulic turbine and marine products department, **Baldwin Locomotive Works,** Eddystone, Pa. His activities in addition to the sales of turbines, ship propellers and other marine products will embrace the handling of all products of the Baldwin brass and iron foundries and the handling of negotiations with the U. S. Government on projects of a special nature.

H. E. Ryker joined **Hughes Aircraft Co.,** Culver City, Calif., as advisor and special assistant to the vice presidents and general manager. He formerly was vice president of production, Lockheed Aircraft Corp.

NEELE E. STEARNS
. . . *president, Inland Steel Products*

WILLIAM G. CAPLES
. . . *president, Inland Steel Container*

Inland Steel Co., Chicago, has named new presidents for two subsidiary companies. **Neele E. Stearns,** top operating executive of Inland Steel Products Co. as executive vice president, was made president of that subsidiary, and **William G. Caples,** acting vice president in charge of Inland Steel Container Co., was elected president. Previously **Clarence B. Randall,** president of the parent company, had also served as president of the subsidiaries. Mr. Stearns joined Inland in 1940 and was assistant general sales manager of the parent company before his transfer to the subsidiary in 1949. Mr. Caples joined Inland in 1946. He was elected vice president of the container manufacturing subsidiary in July, and previously was manager of industrial relations for the parent company and subsidiaries. **Lemuel B. Hunter** succeeds Mr. Caples as industrial relations manager of Inland Steel Co., and is in turn succeeded by **Carl B. Jacobs** as raw materials manager.

J. M. Frolio has been added to the sales organization of **Everite Pump & Mfg. Co. Inc.,** Lancaster, Pa. He will sell Everite pumps and water systems in southern New Jersey, eastern Pennsylvania and central-southern New York. **Paul Emerey** was assigned a new southern territory consisting of North and South Carolina, and Georgia in addition to his present area of Virginia, West Virginia, Delaware and Maryland.

Hunter Spring Co., Lansdale, Pa., has added three new field engineers to its sales force and, in reorganization, has allocated new territories throughout New England and the Middle Atlantic states. The new men are **James P. Glidden** to cover Massachusetts, New Hampshire, Vermont and Maine; **Donald A. Beardsworth,** Connecticut, Rhode Island and New York city; and **Joseph E. Curry,** New Jersey. Veteran field representatives are **Bill Sohl,** covering western Pennsylvania and eastern Ohio; **Del Bennett,** New York state except New York city; and **Sam Whiteley,** eastern Pennsylvania, except Philadelphia. **John Sigafoos,** who previously worked on sales service out of the plant in Lansdale, will now cover Philadelphia county.

Ray O. Hill replaces **Anthony Slanga,** resigned, as comptroller, **Cannon Electric Development Co.,** at the Los Angeles factory. **John K. Trotter** assumes the position of production manager formerly held by **Richard L. Rowen,** now vice president

OBITUARIES . . .

Harold A. Manderson, 54, director of purchases, **White Motor Co.,** Cleveland, died Aug. 17. He joined the White company in 1945, and previous to association with War Production Board in 1941 was with Continental Can Co. for ten years.

Ross J. Beatty, 96, who pioneered in the natural gas fields in northern Indiana and was one of the first officers of **Inland Steel Co.** at Indiana Harbor, Ind., died Aug. 19. He retired in 1925 as vice president.

William M. Clark, 70, a pioneer in electric lamp development work at Nela Park, lamp division of **General Electric Co.** in Cleveland, died Aug. 20 at his summer home on Casco Bay, near Portland, Me. He retired in 1946.

Col. Sir W. Charles Wright, 74, Great Britain's steel controller in two world wars and former president of the **British Iron & Steel Federation,** died Aug. 14.

Timothy M. O'Brien, 77, for many years superintendent of the foundry of **Clark Bros. Co. Inc.,** Olean, N. Y., died Aug. 11 after a long illness.

George C. Berner, 63, mechanical service manager, **Addressograph-Multigraph Corp.,** Cleveland, died Aug. 20. He joined the company in 1909 and later organized and headed its mechanical service department.

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Production AND Engineering
NEWS AT A GLANCE

NICKEL PLATED TUBING FOR GAS WELLS— Keeping abreast with demand for petroleum products forced the oil industry to rely on production from "sour" oil wells. But the problem did not end here. Presence of hydrogen sulphide along with carbon dioxide in these wells caused another headache—corrosion of oilwell tubing carrying the sour crude oil. To combat these extreme corrosion conditions the industry resorted to nickel plating the internal portions of the tubing. Thus far over 30,000 lineal feet of 2 to 2½-inch tubing have been internally nickel plated for the purpose. One 10,000-foot length of plated tubing, International Nickel Co. reports, was sunk several miles offshore in the Gulf. It was given a nickel deposit of 0.0060-inch. Plating was regulated to deposit nickel over the outside threads on the ends of the tubing to protect them.

MAINTENANCE ANSWER—SHARE KNOW-HOW—Sharing maintenance know-how with users of your equipment is one approach to the problem of overcoming maintenance costs. At least that is the method Westinghouse used in a six weeks' course on practical methods and practices it conducted for 160 men. The course provided the men with latest information on maintenance of electrical equipment—primarily motors and controls—as well as some practical shop hints. It was divided into six sessions of two hours each, conducted by men who spent an average of 20 years in such work.

DOUBLE DUTY FASTENER— A new plastic-metal fastener, comparable in strength and accuracy to a standard metal screw, yet including advantages of electrical insulation, shock resistance and vibration damping is reported by Forman Insulating Screw Corp., N. Y. Already being used in the manufacture of electrical components and mechanical assemblies, it basically consists of a serrated metal core which is extrusion-coated with a thermoplastic material. The metal core, running the entire length of the screw, provides the necessary strength; insulating and sealing qualities are provided by the plastic exterior. The company states there is no danger of the plastic chipping or cracking under torque.

"STATISTICS" ON INSPECTION—Each part that goes into one of White Motor Co.'s super power trucks is given an average of 13 careful inspections before it leaves the assembly line. A five-speed transmission, however, goes through 1921 inspections from raw material to finished unit. A total of 19,897 individual inspections are made before a truck actually leaves the factory. At the rate of one per minute, it would take one man 42 days to make all inspections required.

GOOD "SHOOTING"—Gunning for both fast production and low cost in brazing components of its 12-gage pump action shotgun, High Standard Mfg. Corp., Hamden, Conn., achieved both objectives by using the proper brazing alloy. Five "targets" were involved Handy & Harman reports. These were: Brazing the rib to receiver, rear block to receiver, action bar to forehand tube and collar to magazine tube. Score: Five strong assemblies in a total time of 3 minutes, 33 seconds—with a fraction of an ounce of alloy per joint and no necessary finishing—in all good "shooting".

PUNCHABILITY PLUS — Cold reduced sheets as a magnetic core material for motors partly indicate their superiority through results obtained in punching operations according to Harry F. Shannon of Carnegie-Illinois. He says more lamination per die grind and longer die life are obtained when punching laminations from the cold reduced product. The fact that surface oxides are thinner is another reason in the metal's favor. Most manufacturers are faced with a space limitation problem and this space factor is mainly determined by the character of oxides present on the sheets. (p. 72)

ADAPTABLE AND FAST—Versatility of induction heating is such that much time can be saved in high production processing. Cost of one item, for example, was cut from $1.57 to 10 cents per piece. Adaptability of the method was shown by one company in processing hundreds of different engine compressor parts—merely by changing tooling. Heating of wrist pins, formerly requiring 113.5 hours, is now done in 3.5 hours. (p. 77)

FINISHING TOOL—Metal spraying now can be accepted as another "finishing tool". But its big advantages come from knowing what metals to use for a given application, when and how to paint sprayed surfaces, and how to seal these areas. Depending on the application at hand, the technique can be used to effect economies two ways: By stepping up production through its speed and portability of equipment, and its judicious use in connection with finishes in special applications. (p. 79)

OXYGEN RECOVERS SCRAP—Oxygen technique employed by English steelmakers to recover stainless steel scrap causes about 96 per cent of the chromium to pass back into the molten steel. In their practice the stainless steel scrap is melted in the furnace with no regard for carbon contamination. When oxygen is blown into the metal, the gas oxidizes from the steel such elements as silicon and manganese. Subsequently the carbon oxidizes until as little as 0.05 per cent remains. Some chromium is oxidized, but greatest portion is passed back into the steel at a later stage. (p. 87)

Cold Reduced Steel Gains Favor as Magnetic Core Material

Improved punchability, magnetic properties equivalent to those of hot rolled sheets, thinner, less abrasive surface oxides are some of the reasons electric motor and dynamo manufacturers are using cold rolled sheets for magnetic cores

By HARRY F. SHANNON
Research Associate
Carnegie-Illinois Steel Corp.
Pittsburgh

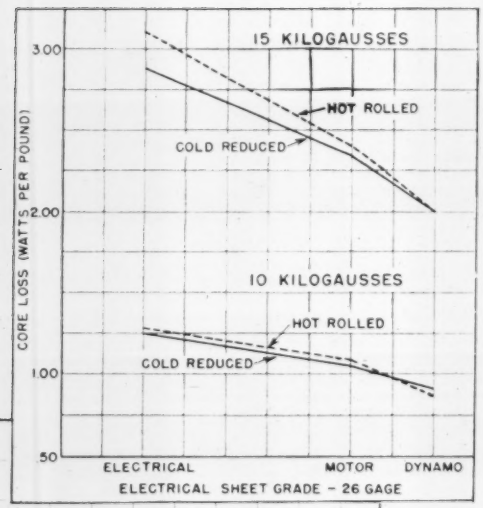


Fig. 1—Core loss of 26-gage hot rolled and cold reduced sheets in electrical, motor and dynamo grades

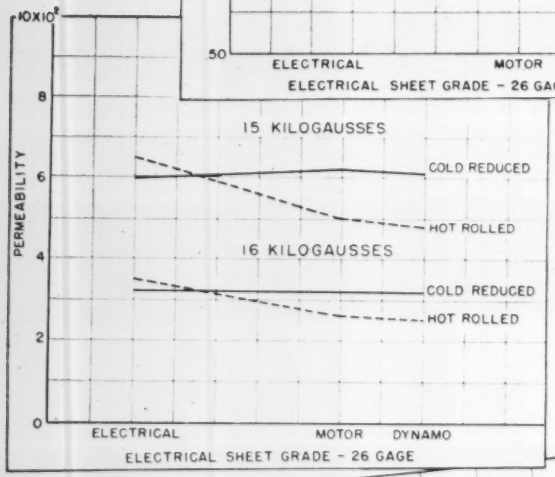


Fig. 2—Permeability of 26-gage hot rolled and cold reduced sheets. Curves indicate that, in the same grade, d-c permeability of 26-gage hot rolled and cold reduced sheets are comparable

Fig. 3 — Typical torque curves obtained on isotropic and anisotropic materials

Fig. 4—Torque curves for 24-gage electrical grade hot rolled and cold reduced sheets

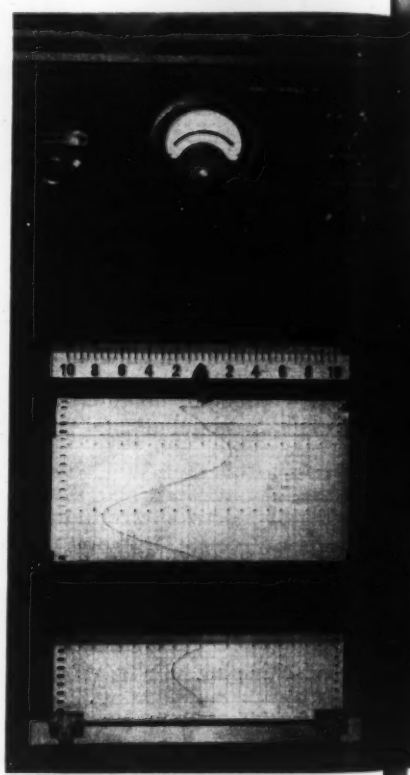
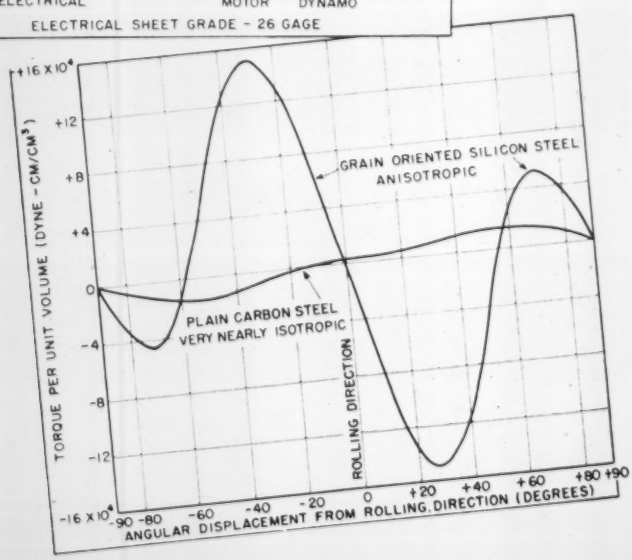
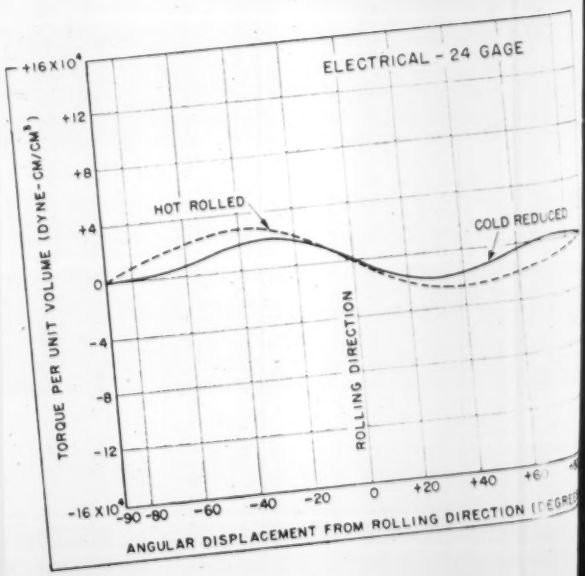


Fig. 5 (right)—Automatic, recording torque magnetometer determines degree of grain orientation of sheets. The inventor, D. S. Miller, is positioning a disk sample in the specimen holder between poles of the electromagnet used to supply the magnetic field



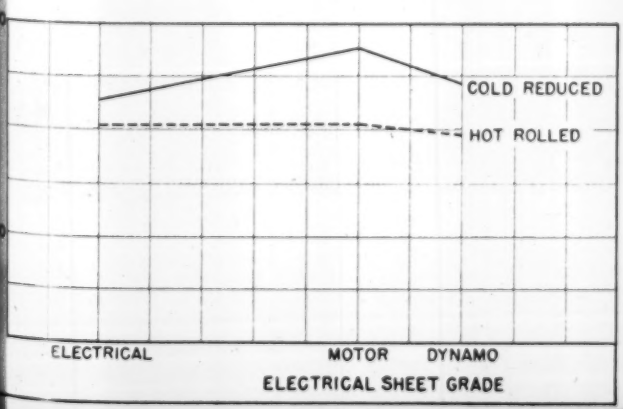


FOR MANY years the magnetic cores of rotating machines such as motors and dynamos were constructed of laminations punched from hot rolled silicon steel sheets. Recently, however, the trend has been toward the use of material processed in continuous coils by the cold reduction method.

Substitution of cold reduced for hot rolled sheets can be made without sacrificing any of the qualities desired in the completed machine. Furthermore, it was demonstrated that the cold reduced product possesses several additional attributes which can be used to advantage by the manufacturer of rotating machinery.

Similar Magnetic Properties — While processing methods may differ widely, the finished hot rolled and cold reduced sheets have essentially the same magnetic properties. This is indicated by results of conventional core loss and permeability tests made on samples of the grades most commonly used for rotating machines. In processing sheets for rotating machinery, wherein randomness of magnetic properties is desired, every effort is made to reduce the amount of preferred orientation to a minimum.

Fig. 6 (below) — Lamination factor for hot rolled and cold reduced sheets in electrical, motor and dynamo grades



Surface Oxides Different—Differences in the processing treatments, especially in the annealing practice, result in differences in the surface oxides present on hot rolled and cold reduced sheets; the surface oxides on the cold reduced product are generally thinner and slightly more insulating than those present on the hot rolled product. This is reflected in the results of lamination factor and interlamination resistance tests.

Better "Punchability" — Cold reduced sheets have better punching properties than do hot rolled sheets. That is, more laminations per die grind and a longer life of the die are obtained when punching laminations from the cold reduced product. Part of this superiority may be attributed to a better surface condition. In addition to being thinner, the oxides on the cold reduced product are generally less abrasive and more tightly adherent than those on hot rolled sheets.

Increased die life also results from the use of continuous coils of the cold reduced product, since the partial punchings which commonly occur at the end of cut-to-length sheets, and which may lead to mispunchings, are thereby avoided. The superior punching qualities of cold reduced sheets must also be attributed in part, however, to the fact that the mechanical properties of this product are more conducive to good punchability than are those of hot rolled sheets.

No standard test has been developed for evaluating punchability, but it has been suggested that the ratio of yield strength to tensile strength may be used for this purpose. The higher the ratio, which, of course, is always less than one, the better will be the punching properties. Comparative data demonstrate that the yield-tensile ratio can be correlated with punching performance since cold reduced sheets with proved superior punching properties have higher yield-tensile ratios than do hot rolled sheets.

Core Loss Studied—Principal criterion for judging the quality of sheets to be used in the cores of rotating machines is the magnetic property of core loss. The nature of the application is such that a low core loss is required, although other factors, such as economy, must also be considered.

Samples for this comparison were sheared from cold reduced sheets in the three grades and two gages most commonly used for rotating machinery (USS electrical, motor, and dynamo grades in 24 and 26 gage). The sheets were selected at random and are not necessarily representative of these grades.

Core loss of samples from these sheets, with half the strips cut in the rolling direction and half obtained in the transverse direction, was measured at inductions of 10 and 15 kilogausses in accordance with ASTM specification A-34, 1949.

Curves in Fig. 1 demonstrate very clearly that, in the same grade, the core loss of 26-gage cold reduced sheets is comparable to that of 26-gage hot rolled sheets. There are some variations, as would

be expected, but for design purposes, the two materials can be considered equivalent with respect to core loss. Cold reduced and the rot rolled materials are also comparable in 24 gage.

Permeability Data Obtained—Permeability is not generally specified for sheets to be used in rotating machinery because in such applications the air gap is generally so great that this property is considered to be of secondary importance. Comparative permeability data were obtained, however, to show the equivalence of hot rolled and cold reduced sheets.

The d-c permeability of samples of cold reduced sheets, in the same grades and gages used for the core loss tests, was measured at inductions of 15 and 16 kilogausses in a Fahy Simplex Permeameter. These data are plotted against the electrical sheet grades in Fig. 2 with similar data for hot rolled sheets taken from the Carnegie-Illinois engineering manual.

Curves in Fig. 2 indicate that, in the same grade, the d-c permeability of 26-gage hot rolled and cold reduced sheets are comparable and, therefore, the one type of material can be substituted for the other. The same is true for 24-gage sheets.

Preferred Grain Orientation—Much has been said in recent years about grain-oriented sheets. A great deal of emphasis has been placed upon the fact that a high degree of preferred orientation can be developed in cold reduced silicon steel sheets. Such preferred orientation, which results in anisotropy or directionality of magnetic properties, can be employed to advantage in the construction of transformers, but it is very undesirable in sheets used for rotating machinery. The nature of these machines is such that the direction of the flux path is continually changing in relation to the rolling direction of the sheets.

Thus, the magnetic properties of sheets intended for this application should be approximately the same in all directions. Both hot rolled and cold reduced sheets for rotating machinery are, therefore, processed in such a manner that they possess the maximum amount of isotropy or randomness of magnetic properties. The successful use of thousands of tons of both materials attests that this end has been accomplished. As additional evidence, the degree of orientation and the amount of resulting anisotropy present in 24-gage hot rolled and cold reduced sheets in USS Electrical and Dynamo grades was determined.

Torque Magnetometer Used—The first method used for determining the degree of orientation is one which has been described many times in the literature on preferred orientation, the torque magnetometer test. In this instance, however, the test was used to indicate the *lack* of preferred orientation rather than the *presence* of a high degree of it. The instrument used, also unique, is a fully automatic, recording torque magnetometer developed in the U. S. Steel Corp. research laboratory. An overall view of this instrument is shown in Fig. 5.

The inventor, D. S. Miller, is shown positioning a disk sample in the specimen holder between the poles of the electromagnet used to supply the magnetic field.

Sample Is Motor Rotated—The sample is rotated about an axis perpendicular to the applied field by a small motor in back of the magnet base. Torque developed as the sample rotates is converted to an electrical potential by means of a torsion gage and a resistance strain gage. This potential activates the motor drive for the pen in the recorder on the left. The operation is fully automatic and can produce a torque curve in about 6 minutes.

Two typical torque curves are shown in Fig. 3. The curve with the highest maxima is typical of an anisotropic or grain oriented material, and the curve with the low maxima is a type obtained on very nearly isotropic material. The latter is the type desired in sheets for rotating machinery.

In Fig. 4, torque curves are shown for hot rolled and cold reduced USS Electrical grade sheets in 24 gage. Both curves are similar to those obtained on isotropic material in that the torque maxima are low. Hence, it can be said that little preferred orientation exists in either hot rolled or cold reduced USS electrical grade sheets when properly processed for use in rotating machinery.

Lamination Factor—Most manufacturers are faced with the problem of space limitations and hence require a core material that will give them the maximum amount of steel in a given height of stacked laminations. This property, known as the lamination or space factor, is mainly determined by the character of the oxide present on the sheets. Methods of processing cold reduced sheets are such that the surface oxides produced are thinner than those normally present on hot rolled sheets.

This difference is reflected in the results of lamination factor tests plotted in Fig. 6. Tests were made on samples of hot rolled and cold reduced, 24 and 26-gage sheets in USS elec- (*Please turn to page* 84)

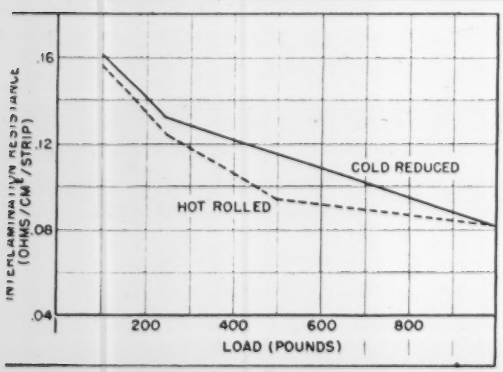
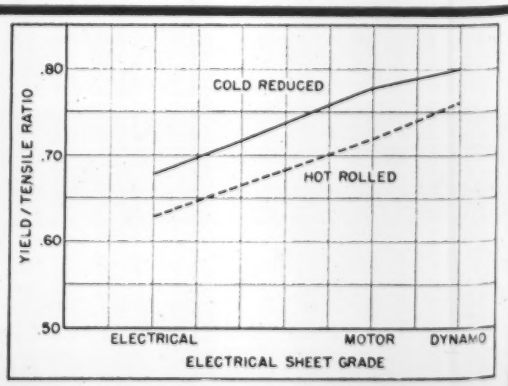


Fig. 7—Interlamination resistance of hot rolled and cold reduced sheets

Fig. 8—Yield-tensile ratio for hot rolled and cold reduced sheets in electrical, motor and dynamo grades



SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

PILING ON THE LOAD: Preliminary figures just released by National Machine Tool Builders' Association covering new orders for July, 1950, show a percentage of 253.3 as compared to a "low" of 48 in July 1949. Bearing in mind that these figures are based on 100 per cent which is a composite of 1945-1947 business of the machine tool industry, the present high level gives cause for worry rather than elation.

Just prior to the outbreak of war in Korea, machine tool business already had reached a high level—the figure for May 1950 standing at 116.4 per cent. Individuals close to the industry credit this improvement largely to determined scientific and co-ordinated sales campaigns carried out lately by all machine tool builders. Be that as it may, this was to a large extent peace-time business.

Since the outbreak of hostilities in Korea on June 25, 1950, there has been superimposed on this heavy and continuing "normal" business, a load of new business placed on the spur of the moment in expectation of machine tool shortages and in expectation of war orders. This likewise will continue and probably will intensify. To meet this situation, the industry already is combing the labor market for skilled men and is putting on night shifts. What next?

According to Tell Berna, general manager, National Machine Tool Builders' Association, in a "front page story" published in the Aug. 17, 1950, *Cleveland Plain Dealer*, another and almost crushing load will be imposed on the already heavily loaded machine tool industry if all-out war comes. The government's war reserve—reputed to be 110,000 machine tools now stored in warehouses—may serve to tide us over the Korean crisis. Beyond that, Mr. Berna has scant faith in the efficacy of this reserve.

American machine tool builders faced a big job in 1914-1918. They carried it out with distinction. In World War II they carried out another assignment which truly was colossal as compared to their achievement in World War I. Whatever the load may be this time, this already "preloaded" industry will manage it somehow—if everybody involved—including government agencies—does everything possible to avoid unnecessary overloading. There can be a final straw that will break the camel's back.

"WORM HOLES" SAVE PIPING: I have just received from Helge Hoglund, general sales manager, Heald Machine Co., Worcester, Mass., an illustrated brochure entitled "Borematic Features".

Among many interesting things in this book, one in particular has caught my attention. This is the remarkable job of coring in the back of the main control panel. I hope that my friends at Heald will not be insulted when I compare these intricate cored hydraulic oil channels to "worm holes". That is exactly what they look like.

Actually this is a tribute to the engineers who designed this intricate maze of passages in the double or triple layers of plates which are bolted together to give the desired manifold arrangement. These cored panels eliminate literally yards of expensive hydraulic tubing in the form of outside plumbing which always is costly, never is decorative and all too often is inclined to leak at the joints.

One of the most effective ways to hold-the-line on machine tool costs is to eliminate parts by combining functions. This merging of panels and channels by Heald is an accomplishment deserving of praise—especially in these days of material and manpower shortages.

SEPARATING WORK FROM CHIPS: One of the notable—but poorly recognized—advances in automatic screw machine practice is that of separating work pieces from chips.

Not so many years ago, this ordinarily was accomplished by "shaking out" the work from the chips after raking the mixture out of the bases of the machines. This was wasteful of parts and of manpower and certainly was not helpful to the finish of screw machine products—the process resembling the lost art of sifting ashes from the old family base burner or kitchen range.

The new and better way is to let the chips fall into the base but to catch the work as it drops off and deposit it in a perforated pan or drain basket. In simple cases this is accomplished by sheet metal or cold rolled rod troughs. In more complicated cases it is accomplished by collector pins or "mechanical hands" actuated by the machine. One of the first of such devices that I recall having seen is that one which plucks screws off the spindles of Brown & Sharpe automatics, presses their head against the slotting saw and then neatly drops them into a work receptacle.

A significant thing about many of these ingenious finished work handling devices is that they are designed and built by the machine operators rather than by tool engineers and tool makers. This is a tribute to the inventive ability and "job interest" of automatic operators—and let no one underestimate the high mentality of shop men. At the same time it is a challenge to machine tool and tool engineers to pay as much attention to handling of finished work as they do to loading and machining phases of the cycle.

As a preliminary step, I suggest that they make some swings around the shop circuit to observe what men in the shops have accomplished. I did that a few weeks ago at Delco-Remy, Anderson, Ind. Hence this tribute to ingenuity at the operational level in a typical American plant.

Fast Welding Speeds Refrigerator Output

FOURTEEN manufacturers of household electric refrigerators have produced 3 million units so far in 1950 and are well into the fourth million. One of these producers, Frigidaire Division of General Motors Corp., Dayton, O., is increasing its output to meet continuing demand and is lowering its manufacturing cost by using several novel welding operations.

In seam welding the food compartment lining assemblies, six straight seam welds fasten the top and bottom panel to the sides and back wrap-around panel. This operation, shown in Fig. 1, is performed by six roller seam welding electrodes simultaneously making the six seam welds. Three 250 kva transformers are employed, each making a series seam weld between two electrodes.

On Rolling Carriage—Each transformer, with two roll head assemblies, is mounted on a traveling carriage which is moved along by hydraulic power as the weld is made. In Fig. 1 the upper carriage is just beginning to travel downward. At the completion of the weld, carriages are retracted and the liner is unclamped and ejected automatically.

On the 9 cubic foot liner shown, a total of 115 inches of welding is completed in 7 seconds. Surface condition on the inside liner after welding is such that no metal finishing is required before porcelain enamel is applied.

Welding the back panel to the outer shell wrap-around requires 120 spot welds after the two pieces are loaded into the automatic welding machine and clamped in place. This welder, Fig. 2, employs fifteen 40 kva welding transformers, each of which is connected to eight hydraulically operated welding guns. Only two weld periods are used, half of the guns firing during each period; the 120 welds are completed in a few seconds.

Assembled Before Welding — Following this sequence of operations, the lower horizontal and bottom panel assembly is spot welded to refrigerator cabinet shell, Fig. 3. The two pieces are assembled before the machine operator slides the shell into the machine.

After it is accurately clamped in position, 60 spot welds are made on three different surfaces, the shell front, back and bottom. Carrying out this operation are eleven 40 kva transformers and a 100 kva transformer. Welder is equipped with safety devices which prevent accidental clamping of the fixture. The operator must have both hands on the start buttons to initiate the machine cycle.

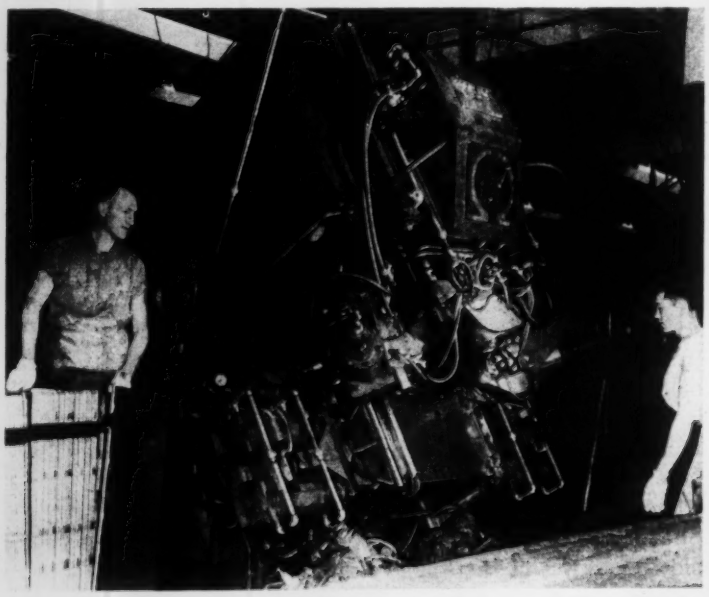
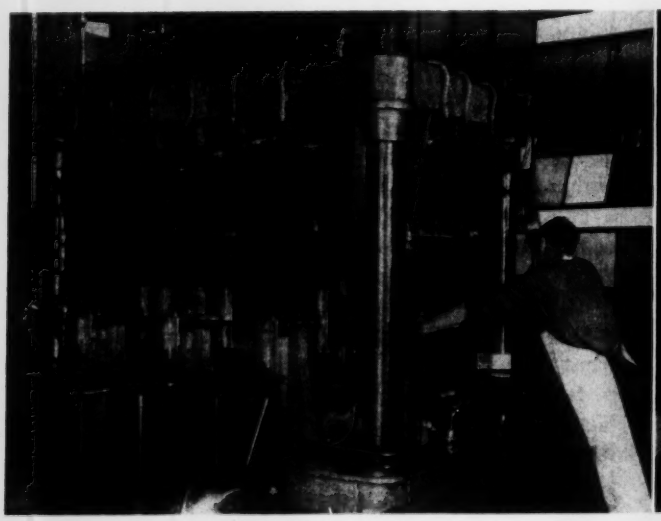


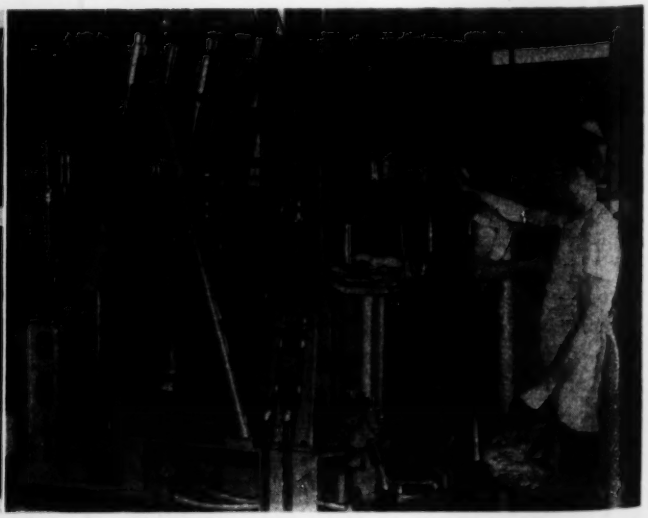
Fig. 1—Welder employed in seam welding refrigerator food compartment liners. Top and bottom panels are welded to side and back wrap-around panels by six straight seam welds. The machine welds at the rate of 115 inches in seven seconds

Fig. 2—In this operation, the back panel is spot welded to the refrigerator outer shell wrap-around. It takes only a few seconds to make the 120 welds

Fig. 3—View showing how lower horizontal and bottom panel assembly are spot welded to the refrigerator cabinet shell. After assembly is clamped in position 60 spot welds are made on three surfaces

Photographs by Dan Reebel





Induction Surface Hardening

Expedites Production, Saves Manpower

Versatility of induction heating is being used advantageously to heat treat a variety of steel parts at great savings in manpower, material and time. Costs on one high production item are cut from $1.57 to 10 cents per piece

IF YOU heat treat parts, even a wide variety of parts, on either a production or semiproduction basis, don't overlook induction heating as a manpower saver as well as a possible cost-cutting tool. Other manufacturers are using the process to great advantage in producing hardened wearing surfaces or in improving physical strength of parts.

The first production use of induction heating for surface hardening was processing of crankshafts. Until the advent of induction heating, the conventional practice was to use a high alloy steel heat-treated to a medium hardness range and then machined.

This method was a compromise between wear and machinability since higher hardness to give improved wear resistance could not be justified on the basis of the higher machining costs. However, the alloy used was selected for the purpose of giving better machinability, and not necessarily physical strength. Change to surface hardening of the bearings permitted the substitution of a plain carbon steel, increased machinability at a lower hardness range, and produced high hardness of the bearing surface for wear resistance.

Fig. 1 shows production units for hardening crankshafts. Today, almost all heavy duty diesel engine crankshafts are surface hardened by induction. Service records show many shafts which have run 1,750,000 miles (a distance equal to 70 times around the world) and are still within the original finished tolerances.

Process Adaptable—As an example of the ready adaptability of induction surface hardening, a single induction heating unit is being used for processing hundreds of different engine compressor parts merely by changing tooling. Production of wrist pins formerly requiring 113.5 hours is now obtained in 3.5 hours. Push rod button formerly required 3 minutes for heat treating, now requires 15 seconds.

Cost reductions on high production items are sometimes enormous. A typical example is the reduction from $1.57 to 10c per piece made possible by a switch from alloy steel to SAE 1045, elimination of straight-

Data and illustrations from the induction and dielectric heating apparatus section, National Electrical Manufacturers Association.

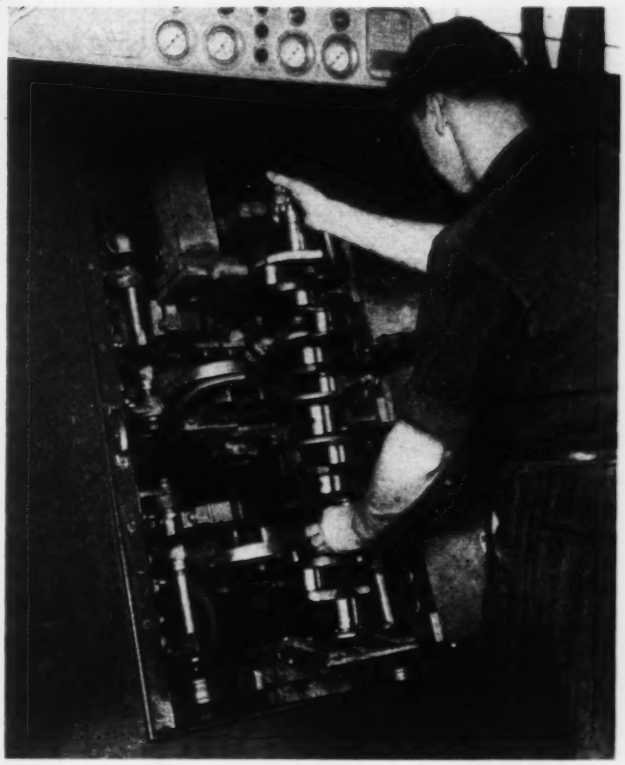


Fig. 1—One of a bank of several units for hardening several bearings on a diesel engine crankshaft. Cycling of heat and quench is automatic from one bearing to the next. Production on four units is 35 crankshafts per hour, with one operator

Fig. 2—Unit for surface hardening axle shafts. Production is 125 per hour, with one operator

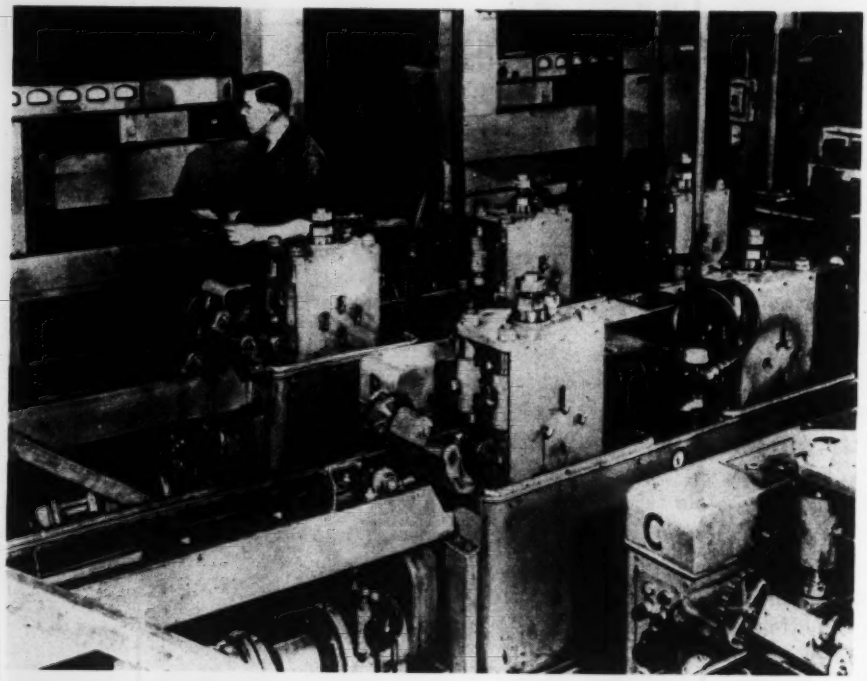


Fig. 3 — Continuous heat treatment of bar stock. Each machine in this battery handles 250 pounds of stock per hour, in size range ⅜ to 3 inches in diameter

ening and cleaning costs, and increased production. The total saving on each run of 1375 pieces was $2172.50.

Surface Hardening Progressively — The best application for induction heating is the progressive or continuous method of processing. Parts may be handled on an intermittent basis by means of a suitable fixture, or may be passed through continuously, one after the other, on a conveyor. The method of handling depends on the production requirements and, naturally, on the shape of the part.

A typical example is a spline shaft ¾-inch long hardened on spline area only at the rate of 580 per hour. Elimination of distortion and scale, and increased production results in saving of $40 per 8-hour day of operation. Progressive surface hardening not only increases wear resistance but torsional properties as well.

Switch to Medium Carbon Steel — Many parts such as tractor track pins and piston pins are surface hardened for wear resistance. Although formerly made of alloy steel and carburized, most track pins are now made of turned and polished medium carbon steel stock, which is cut to length and surface hardened by induction as the final operation.

Axle shafts, on the other hand, are now surface hardened primarily to increase torsional strength as well as to provide wear resistance on spline. The switch from SAE 4140 to SAE 1033 and decreased machining cost made possible by induction hardening saves 25c per axle shaft, and increases torsional fatigue life over 200 per cent, Fig. 2.

Although normally considered primarily for surface hardening, induction heating is also being used for through heat treating. Bar stock in sizes of ⅜ to 3 inches diameter is through heat treated to an absolute uniformity of hardness and metallurgical structure, scale - free and straight. Typical performance, Fig. 3, is for one man to treat one ton of 1-inch SAE 1045 stock per hour, hardened to 63-64 Rockwell C and drawn to 30-31, at a cost of $15 per ton, where conventional methods would run $30 per ton.

Other Operations Performed — Many induction heating installations are used for performing other operations in conjunction with hardening. These include hardening and brazing, and hardening and shrink fitting.

For example, the balancer shaft on a diesel engine which has on it a large collar, was formerly machined from a large diameter bar. Now the operation consists of using a small diameter shaft, and simultaneously induction brazing a collar to the shaft and hardening thrust face of flange and adjacent bearing.

Track roller assemblies for many tractors consist of a hub section to which are attached two track rollers, which must be surface hardened on roller area and adjacent flange. These are now made by locating the hub in a fixture and positioning the two track rollers in inductors through which they are rotated for heating. When the surface is up to hardening temperature, and heat flow by conduction has permitted an expansion of the bore, the rollers are automatically pressed into the hub and water quenched. This produces the surface hardness on the roller and adjacent flanges, at the same time shrink fitting the rollers to the hub, Fig. 4.

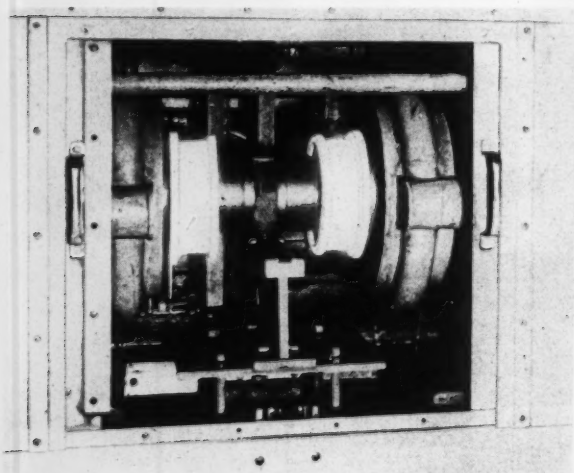


Fig. 4—Combination surface hardening and shrink fitting track roller assembly. Roller is heated, ready for pressing on hub and quenching

Lead Toxicology Data

Factual data on lead toxicology in the form of proceedings of the Lead Hygiene Conference held recently is available from Lead Industries Association, 420 Lexington Ave., New York 17, N. Y. Among the conferees were authorities on industrial hygiene from industry, civic and educational groups, and insurance companies.

Among the subjects covered were solubility and particle size in lead poisoning, aluminum and silicosis, treatment of lead poisoning, a production manager looks at industrial health and a summary of the conference. The 137-page report, which contains 33 illustrations, costs $1.00.

Metal Spraying Pays Off as "Finishing Tool"

Big advantages in using metallizing techniques come from knowing what metals to use for a given application, when and how to paint sprayed surfaces, and how to seal these areas

Fig. 1—Sprayed zinc or aluminum coatings protect this Sturtevant fan against corrosion by exhaust fumes and moisture

METAL spraying now can be accepted as another finishing tool. Depending upon the application at hand, it can be used to effect economies two ways: By stepping up production (through its speed and portability of equipment) and by its judicious use in connection with paints in special finishing applications.

In finishing operations, sprayed metal offers a good base for paint because of its porous structure. In many cases, the sprayed metal itself will provide a good finish. But painting over it is done for two reasons; For appearance, and as a means of providing more economical protection.

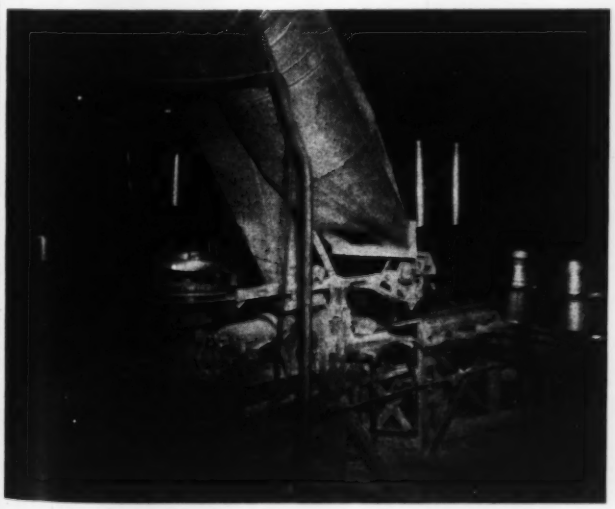


Fig. 2—Production setup for reprotecting welded seam of galvanized steel drums. Metal spray gun is mounted on an arm which is automatically moved in and out of barrel

Generally, the same finish life is obtained from a thinner metallized coating which is painted as a thicker unpainted coating. This is because paint seals the pores and offers additional protection to the sprayed metal.

Whether it is more economical to spray thinner coatings and then to paint, or thicker coatings and not paint, depends on the local conditions and the nature of the article.

Conditions Govern Decision — In cases where a heavy grit blast job cannot be economically obtained, thin sprayed coatings must be used; in these cases, paint coatings should be used in addition for maximum life. Thus, the cost of thorough grit blasting will, in most cases, determine whether it is more economical to use thicker sprayed metal coatings without paint, or thinner coatings with paint.

Aluminum is a better base for paint than zinc, although zinc is satisfactory, providing the right type of paint is used. In general, it is found that paints formulated for good ressistance to penetration, for toughness, adhesion and flexibility, give better service on these sprayed metals than on steel. Zinc chromate and iron-oxide-zinc chromate paints in long oil varnish vehicles are found to be excellent corrosion inhibitive paints for aluminum and zinc.

Paint Vehicles Important — Vehicles made with Bakelite and glycerol-phthalate resins have given satisfactory service and bituminous base paints also give good service on both these metals. Paints, with durable vehicles, containing pigments such as aluminum, iron oxide, red lead, titanium oxide and zinc-

zinc oxide are found to give good service on sprayed aluminum. Very quick drying types of paints or lacquers are useful on sprayed coatings 0.005-inch thick or less, but are questionable on thicker coatings for severe use, due to smaller extent of penetration into the pores. For thick coatings of sprayed metal, an oil type of bituminous base coating is preferable. From an appearance standpoint, one of the most desirable finishes is produced by painting aluminum with Bakelite varnish or glycerol phthalate. This gives a clean metallic look to the finished surface. Tests presently being conducted show excellent performance for vinyl and chlorinated rubbers.

Long-Term Protection — For use in applications where salt fog is encountered, aluminum has been found to be more durable than zinc. In such uses, where maximum protection with a minimum of maintenance is desired, and where a painted surface is not required for appearance, a thickness of 0.01 to 0.012-inch of aluminum with no painting or other treatment has been recommended. Such a coating can be expected to give at least 15 years of protection without further maintenance. For equal protection, and where appearance is not important, a thickness of 0.007 to 0.010-inch of aluminum plus a coat of paint should give 15 or more years of protection

Fig. 3—Porcelain piece being sprayed with copper to give a band that can be soldered to by conventional methods. All photographs courtesy Metallizing Engineering Co. Inc.

from rust, without repainting or further maintenance. The paint will probably fail earlier than this from an appearance standpoint, but the aluminum will last and protect the steel. Paint should be applied over the spray coat while it is clean and dry for best results. This thinner aluminum coat followed by paint should be used in cases where a thorough blast job cannot be obtained, such as with annular steel grit.

Industrial Atmospheres vs Mild—In industrial atmospheres, such as in manufacturing cities and near factories, aluminum is preferable to zinc as a sprayed metal coating. A coat of paint is generally more important in industrial atmospheres due to the presence in the air of more sulphur dioxide, sulphuric acid, hydrogen sulphide and other corrosive fumes. An oil paint seals the pores of sprayed metals and prevents penetration through to the base material. A light coat of paint reduces the exposed area.

For service in mild atmospheres, where the corrosive fumes and gases are absent, and in hot and dry atmospheres, zinc has always given excellent service and is preferable to aluminum. Thinner coatings may be used with zinc than with aluminum, and there is less danger of corrosion at points where the coating is thin due to inaccessibility, or poor judgment on the part of the operator.

Adhesion of zinc is also better on surfaces which are not ideally prepared, and for this reason it is generally lower in cost if painting is not done. A coating of zinc, 0.005-inch thick, for mild exposures could be expected to last 20 years without painting or further maintenance. Wetter and more severe exposures would call for thicker coatings, if the maximum life is required.

Fresh Water vs Sea Water — Zinc and aluminum sprayed coatings are both satisfactory for protecting steel in immersion in cold fresh water. Immersion conditions are usually more severe than atmospheric conditions, but in immersion there is the advantage that there is greater electrolytic protection to uncoated areas around seams, joints, etc., particularly when zinc is used.

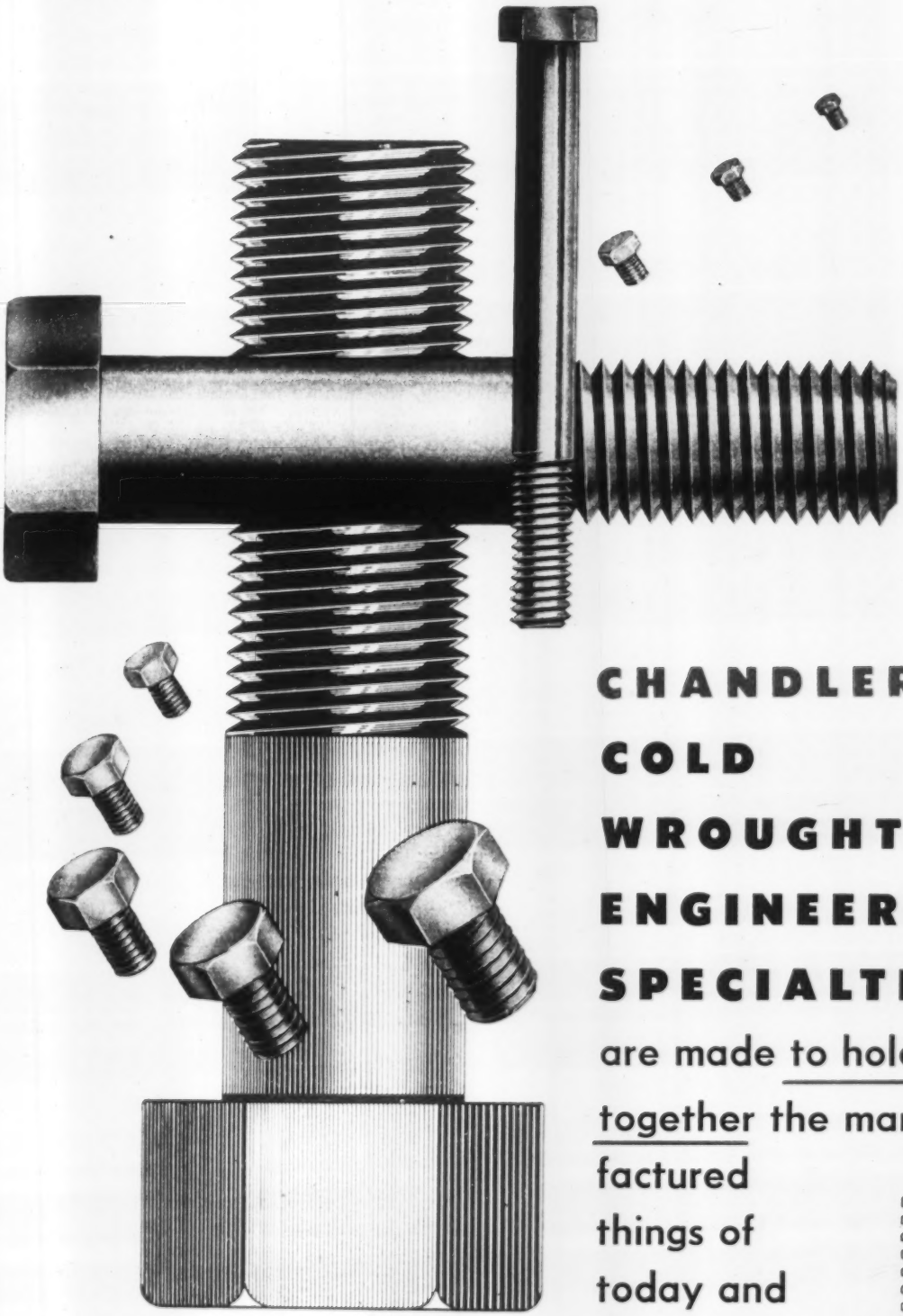
The problems involved in sea water immersion are either corrosion or fouling with sea growth. Pure unpainted zinc has some antifouling properties and may be used for sea water immersion if used unpainted. Zinc has been used successfully on hulls in northern waters where fouling is not serious.

Whenever aluminum coatings are used in water immersion, it is important that the bond to the steel base be very strong. For this reason, it is best to use the sprayed-steel under-coat method of bonding

Protecting Welded Seam in Steel Drums—In barrels and drums which are made of heavily galvanized sheet, the protection against corrosion which is afforded by the galvanizing may be destroyed by welding. One of the problems facing fabricators and users of this type of equipment is that of reprotecting this area after fabrication. Metal spraying has been used in production set-ups designed to economically apply a coating of zinc to the area adjacent to the longitudinal welded seam.

Sealing Sprayed Metal—In using sprayed cathodic coatings such as lead, stainless steel, Monel, bronze, etc., it is necessary to close the pores entirely if they are to be used for severe corrosion resistant applications. Lead coatings may be sealed by shot-blasting, provided a sufficiently strong bond is obtained to the base. The recommended practice is to spray a thin coating of steel before spraying the lead. The procedure is to spray 0.002 to 0.003-inch of steel on to the blasted steel surface, followed by a coating 0.030-inch thick of lead. The lead surface is shot-blasted thoroughly using No. 16 round steel shot at 35 to 50 pounds pressure. If a suction machine is used the pressure should be 75 to 100 psi.

For certain special applications, it is desirable to seal sprayed coatings of stainless steel, Monel, nickel, bronze, etc.; this procedure is useful for such items as hydraulic pump plungers which are subject to considerable pressure. Sometimes the pressure forces the liquid through the pores and under the



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coatings, which results in a cracked coating when the pressure is relieved. Sprayed coatings of these metals may be sealed for such use by applying either tung oil or linseed oil. Raw tung oil and either raw or boiled linseed oil work well. The oil should be mixed with 5 per cent by volume of cobalt liquid dryer.

How To Do It—Procedure is to paint or dip the work while still warm after spraying, but not hot. After a few minutes, the surface is given a second coat by painting or dipping. As many more coats are added as necessary to fill the coating completely. The coating should appear wet with oil before being left to dry. It is important that the oil be applied before the sprayed metal is finished. Two days or more should be allowed for drying.

After machining, the surface will present a duller finish than when the oil treatment is not used. However, the surface will be smooth and satisfactory as a bearing surface. "Acrowax C" has been used as a sealer for certain types of small parts. Except for acid applications and in instances where known failures have occurred, this sealing practice is not recommended, as it is unnecessary for machine work.

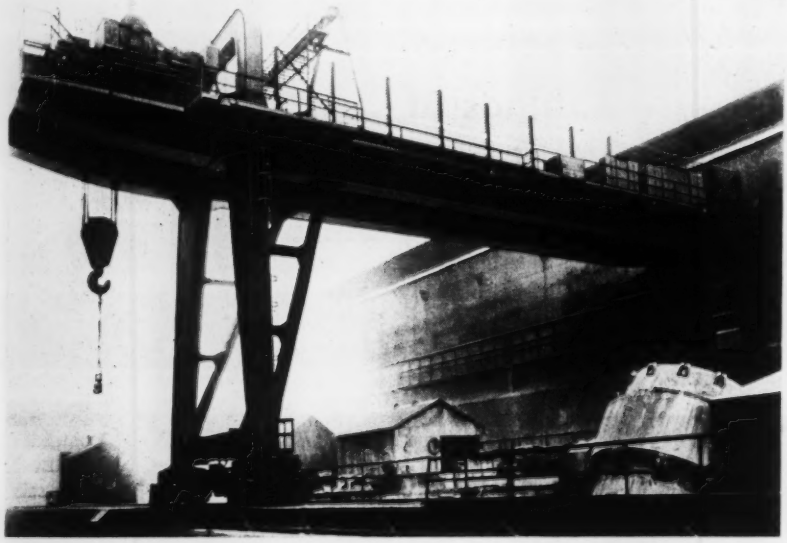
Corrosion At Elevated Temperatures—Metallizing has been used with supplementary treatments to increase the service life of iron and steel heat treating equipment. Representative uses for such processes known by the trade name of "Metcolizing" are as follows: Salt pots; annealing boxes, cyanide pots; wire annealing retorts; carburizing boxes; heat treating pots; magnesium pouring pots; damper plates; aluminum pouring pots; aircraft exhaust stacks; aluminum ingot molds; crown sheets; furnace and kiln parts; magnesium super heaters; furnace tuyeres; aluminum melting pots; furnace conveyors; neutral salt pots; structural steel furnace parts; pyrometer tubes and brackets.

In one process of this type, for protecting iron and steel surfaces from the corrosive action of hot gases up to 1600°F, the surface is first grit blasted and then metallized with a coating of aluminum. A special sealer is then applied to the sprayed metal coat. The article is then heat treated to bring about penetration of the aluminum into the steel surface. The sealing coat protects the aluminum from oxidizing, and gives it time to absorb into the steel. Eventually, the sealer burns through, permitting the external surface of the aluminum to oxidize. Final coating consists of an external surface of aluminum oxide, and under this a coating of aluminum in solid solution in iron. Near the surface, the concentration of aluminum is relatively high. This coating is stated to be resistant to sulphur gases up to 1600° F.

Finishing Sprayed Metal—The structure of sprayed metal deposits is granular rather than homeogeneous. In spraying, the minute particles of metal strike the surface at high velocity, flatten out, and build up, one on the other. This structure, which by its relatively low coefficient of friction and oil-retaining qualities makes sprayed metal ideal for all bearing surfaces, creates a problem in finishing. Sufficient working data for both machining and grinding have been established to permit production finishing of all of the commerically used metals that have been developed for metal spraying. Naturally, some finish better than others, and some may be more troublesome than others, but finishes within commercial tolerances can and are being obtained.

Decorative Uses—Metal spraying is being increasingly used for decorative purposes and combinations of decoration and corrosion protection. Some uses that have been reported are as following: Coating ordinary steel tubing with brass for the manufacture of hand rails and door handles; stainless steel on elevator push button panels; anti-slip characteristics and appearance of worn steel stair treads are restored by coarse sand blasting, then spraying with several coats of brass.

Other well-known applications of the above process are restoring worn mechanical equipment to service and salvaging mismachined or other defective parts.



BIGGEST IN THE LARGEST: Serving four bessemer converters in the world's largest pipe mill at National Tube Co., Lorain, O., is this 125-ton single-leg gantry crane, built with the distinction of being the biggest of its type by Cleveland Crane & Engineering Co., Wickliffe, O. Of all-welded design, the crane incorporates a box-section portal type leg to provide maximum torsional rigidity. Hermetically sealed welded box sections provide resistance to corrosion, always a problem in bessemer areas. Bridge rides on eight equalizing type two-wheel trucks, four on the gantry leg and four on wall end of crane girders. Each pair of trucks has a direct-connected individual motor drive, making four bridge drive motors

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STEP 1

Apply Dye Penetrant

STEP 2

Remove Excess Dye

STEP 3

Apply Developer
Flaws Are Revealed

STEP 4

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Cold Reduced Steel

(*Concluded from Page 74*)

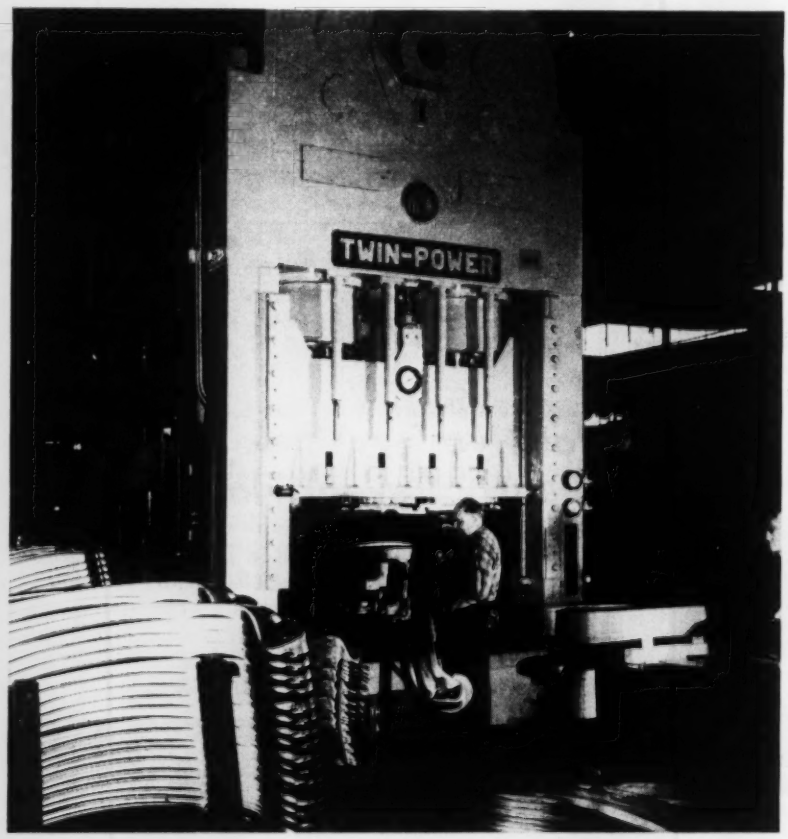
trical, motor and dynamo grades. Results obtained on the two gages were averaged. As indicated by the curves, the percentage lamination factor for cold reduced sheets in each of the three grades was higher than that for the comparable hot rolled sheets, indicating better space factors and thinner surface oxides.

Interlamination Resistance Tests Run—Most manufacturers follow the recommended practice of punching laminations, annealing the laminations at a low temperature to remove punching strains, and then coating with an insulating varnish to obtain the necessary interlamination resistance. Others do not apply the varnish but, instead, depend upon the mill oxide present on the sheets for the necessary insulation. To check the insulating properties of the oxides on hot rolled and cold reduced sheets, interlamination resistance tests were made on samples of both materials. The results of these tests, as shown in Fig. 7 indicate that the insulating properties of the oxides on both materials are very nearly the same.

Mechanical Properties—Mechanical properties have long been the stepsister of magnetic properties in the electrical industry, but with the advent of high speed punch presses, they have become the Cinderella. Little is known about the fundamental factors that contribute to good punchability, but a vast amount of empirical data and experience indicates that the punching properties of cold reduced sheets are superior to those of hot rolled sheets. To afford a comparison, mechanical properties were measured on samples of USS electrical, motor and dynamo, hot rolled and cold reduced sheets in 24 and 26-gage. In all instances the properties of 24 and 26-gage sheets were averaged in order to present a composite picture.

Yield-Tensile Ratio Higher — Conventional tension tests were made to determine the yield strength and tensile strength of longitudinal samples in each of the grades and gages. The ratio of yield strength to tensile strength was calculated from these data and plotted against electrical sheet grade, Fig. 8.

It is apparent from these curves that, in the same grade, the yield-tensile ratio is higher in cold reduced sheets than it is in hot rolled sheets. Furthermore, these curves also show that the yield-tensile ratio increases as the silicon content is increased in both types of material.



VIRTUALLY NO REJECTS: This claim is made for this Twin-Power mechanical metal drawing press recently developed by Hydraulic Press Mfg. Co., Mt. Gilead, O. It is reported that production increases up to 50 per cent have been realized on several initial runs of 6000 difficult parts. Conventional mechanical presses use an eccentric or crank stroke equal to press stroke, but this one has an eccentric stroke of less than half of the press stroke, applied only to the lower or work part of the stroke. Approach part of stroke is made independently of eccentric by fluid action. This application of the short stroke eccentric is said to result in an increase of up to 70 per cent in strokes per minute if conventional draw speeds are used. Higher tonnage is provided through the greater portion of the working stroke

Broaching Made Versatile

Both sides of from 6 to 15 hand stamp blanks are accurately tapered by an adjustable surface broaching setup. With each cutting stroke of the machine, the tough vanadium tool steel blanks are broached, the exact number depending upon the size of hand stamp stock.

By simple adjustments, the equipment, designed and built by Colonial Broach Co., Detroit, can be used interchangeably to broach stock as small as ½-inch and as large as ⅝-inch as well as different lengths. Using a 10-ton, 36-inch stroke press equipped with a manually operated fixture, the setup is said to combine advantages of high output rate and precision characteristics of broaching with adaptability to production in job lots as needed.

Two separate broaches are attached to the ram by means of a cross-head and T-slot arrangement. This permits lateral adjustment, so that the two opposing sets of cutting teeth may be moved apart or together as desired. Broach bars are so mounted that they they may be adjusted laterally by screw operated wedges. The magazine, which is normally locked in the fixture, is readily interchanged when shifting from one blank size to another.

Makes Stone Selection Easier

Standard label colors have been adopted for each of the several types of sharpening stones offered by Behr-Manning Division, Norton Co., Troy, N. Y. The wrap-around labels show code number, brand name, size on the end area and quantity, grit, shape on the sides.

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Oxygen Technique Salvages Stainless Steel Scrap

Electric steelmakers in England resort to oxygen lance during the meltdown period, thus utilizing the alloy scrap which arises during conversion

BEFORE the use of the oxygen lance in English steelmaking practice, most of the stainless steel scrap, or waste from the manufacture of stainless commodities, was almost unuseable by companies manufacturing stainless steel solely in arc furnaces. Manufacturers were obtaining an ever-increasing tonnage of scrap stainless material containing valuable elements such as chromium and nickel which could only be remelted in comparatively small quantities in high-frequency furnaces.

One element in stainless steel, which must be under control within a narrow range, is carbon and in the chromium-nickel stainless steels it often is desirable to finish with a carbon content less than 0.08 per cent.

In the arc furnace, due to the close proximity of the carbon electrodes to the metallic charge, experience has shown that it is impossible to prevent a pickup of carbon in the steel during melting and often to such extent as to render the steel practically unuseable. By the old technique a relatively slow method of removing carbon had to be used, in the course of which chromium also was removed. It was this feature which severely limited the quantity of stainless steel scrap in the charge.

Carbon Now No Obstacle—In the technique employing oxygen it is immaterial whether the carbon in the molten charge is high or otherwise, because excess carbon can be removed readily.

Under the oxygen practice in England, charges consisting entirely of stainless steel scrap are melted in the furnace with no regard for carbon contamination. When molten, pure oxygen gas is blown into the metal. The oxygen burns or oxidizes from the steel such elements as silicon and manganese which all tend to increase the temperature of the molten bath. Subsequently carbon oxidizes until finally, if desired, as low as 0.05 per cent may be reached, and this without nearly the same loss of chrome.

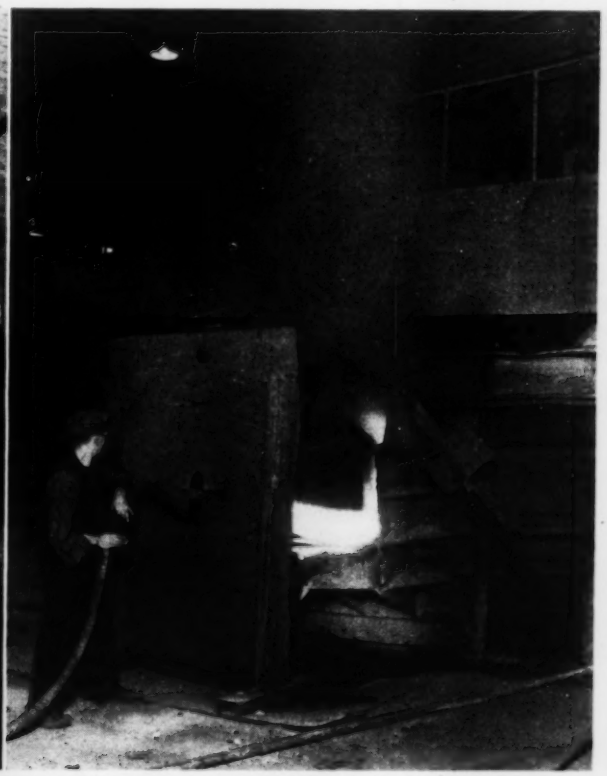
Chromium Is Recoverable—During the oxygen injection some chromium is oxidized, thereby generating more heat, and mainly passes into the slag. At a later stage in the process, however, about 96 per cent of this chromium can be made to pass back into the molten steel. At the end of the blowing period, the temperature within the furnace is estimated to be upwards of 2000° C. During the blowing process the pressure of the oxygen gas, its rate of flow and the volume used must be carefully controlled.

This technique of oxygen lancing of molten stainless steel charges is the answer to the remelting of many thousands of tons of stainless steel scrap. Moreover it is said to produce superior steel. Oxygen lancing is one of the most important developments in the manufacture of stainless steel since its initial discovery.

One Company's Practice—Practice at the plant of Edgar Allen & Co., Sheffield (Yorkshire) England, when working an 18-8 stainless heat in a 5-ton arc furnace, is to build up the composition to 0.5 per cent carbon in order to obtain a better boil. When

Fig. 1—Melter about to lance oxygen into electric arc furnace at Edgar Allen & Co., Sheffield, England

Fig. 2—Start of oxygen blow in 26-ton arc furnace at Brymbo Steelworks Ltd., Wrexham, North Wales



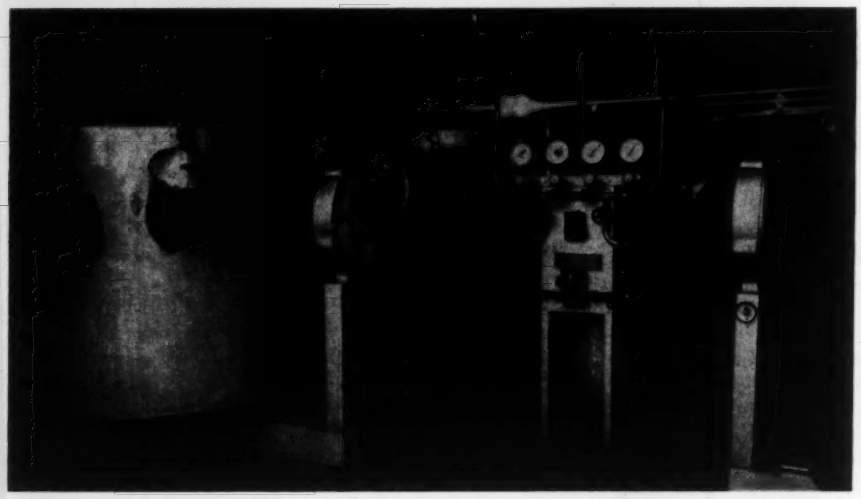


Fig. 3—Oxygen plant at Brymbo Steelworks Ltd., showing evaporators mounted on scales

the bath reaches a temperature of about 1650° C, oxygen is blown into the metal for about 10 minutes through a lance inserted below the surface. Later when the carbon reaches about 0.1 per cent, oxygen is blown for an additional three minutes which reduces the carbon to about 0.06 per cent.

After lancing, sufficient ferrosilicon is added to bring back into the metal the small amount of chromium taken up by the slag, and then ferrochrome is added to bring the metal to specification. Experiments are being made to use a ternary alloy composed of 50 per cent silicon, 30 chromium and 20 iron to be added in one charge instead of two stages.

Short Cooling Period—Temperature of the bath at the end of the lancing operation is estimated to be 2000° C. The metal is tapped at a temperature ranging between 1500 and 1600° C. The period of cooling between lancing and pouring is about 1½ hours though this gradually is being reduced by the addition of fresh scrap. Even so, the shop claims a savings of about an hour on each heat as compared with the old method of melting.

A similar technique is being employed at the Brymbo Steelworks, Wrexham, Wales, for the manufacture of low-carbon alloy steels. Here chromium is not a problem, but it is desirable to work larger charges down to low-carbon contents without excessive current consumption.

Arc furnaces of 29 tons capacity are used. Oxygen is piped to the melting shop from an oxygen plant containing two liquid oxygen evaporators of 47,000 cubic feet capacity which are mounted on scales to give readings in cubic feet.

Oxygen Flow Controlled—Oxygen is blown into the furnace with the current switched off through lances of about ¾-inch diameter soon after the charge is melted down. During the consequent increase of the bath temperature and the FeO concentration, which are characterized by a dense brown fume and later flames, the violence of the carbon oxidation may cause the metal to boil over the sill. The rate of oxygen flow, therefore, must be controlled carefully.

If possible the carbon is reduced to the desired composition in one operation, but intermediate slagging is necessary in some circumstances. During the operation the lance is consumed, and at Brymbo the operators have developed a particular skill in coating the lance tip with slag so that it may be preserved for half an hour or more.

For a 26-ton heat about 10,500 cubic feet of oxygen is consumed, or 395 cubic feet per ton of charge at a pressure of about 120 pounds per square inch. Carbon thus is reduced from 0.54 to 0.049 per cent. Roof life is about 50 heats. The furnace is lined with dolomite, and compared with the former method of operation, the life of the lining measured in tons of bricks per ingot tons is not much reduced.

The Difficult Made Easy

To drill and ream lightening holes economically in six crank throws of a 12-cylinder air cooled engine crankshaft, LeMaire Tool & Mfg. Co., Dearborn, Mich., built a horizontal one-way 6-spindle drilling and reaming machine with two work holding fixtures. It consists of a hydraulic feed unit having 60 inches of feed with a 6-spindle head, fabricated steel fixture base and two work holding fixtures. Because of the size of the holes—1⅝ inches—which were drilled from the solid in very tough steel, drills were of unequal length and load was divided by staggering the drilling operation.

After drilling the crankshaft is transferred to the reaming fixture, these operations were handled by three spindles in the same manner as drilling. Two parts are in operation at one time, one being drilled and the other being reamed. After parts are loaded and clamped in place, the machine goes through the entire cycle automatically, feeds being controlled by cams mounted on a cam rail. The three drilling spindles are arranged to feed coolant through oil tube drills. Reaming spindles have coolant flooded on tools.

Punching Five Times Faster

Equipped with a special multiple punching setup eliminating the necessity of lay-out is a press brake which has reduced the operation time for punching support angles for dust collectors from 6.0 minutes to 1.2 minutes per piece for American Wheelabrator & Equipment Co., Mishawaka, Ind. Use of the brake, made by Cincinnati Shaper Co., Cincinnati, has also resulted in savings on punching time of support channels, side angles and truss braces for dust collectors.

Holes which previously had to be laid out by hand with a template, then punched one at a time, now are all punched at one time after the machine is set up. Punching equipment includes two sets of interchangeable punching blocks and covers the entire range of channels and angles required by the company. Equipment is arranged to punch either leg of the angles and both the web and flange of channels. The punches have fixed strippers.

Special pneumatic clamping equipment is mounted on the front of the press brake, two air cylinders rotating a clamp which automatically holds angles and channels securely to the punching blocks. Punching bolsters are kept in alignment by two leader pin sets so that the equipment can be quickly placed in the press brake or removed to make the brake available for regular bending and forming work.

Chart of Nuclides

AVAILABLE from General Electric Co., Schenectady, N. Y., is a chart of the nuclides, prepared in the Knolls Atomic Power Laboratory operated by the company as part of its research laboratory. Copies are offered with an explanatory booklet.

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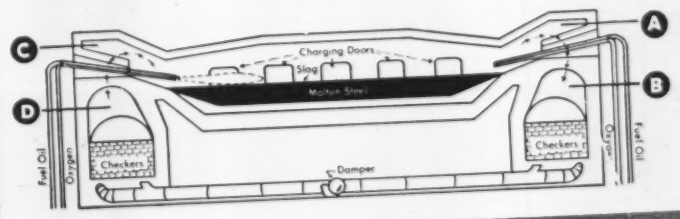

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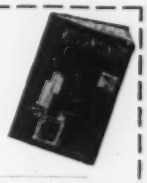

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Brushing Realizes Savings

Next time you see any pieces of chromium plated metal furniture, feel the surface smoothness. To obtain this smoothness, Sparton Chrome Furniture Mfg. Co., of Philadelphia, polishes straight cold rolled tubing prior to shaping so as to blend tool marks in preparation for plating. This tubing, which is 4 feet long, is hand-fed into an in-line polishing machine equipped with Fascut brushes, made by Osborn Mfg. Co., Cleveland.

Machine has two heads: First, a set-up wheel, and then a brush section 16 inches in diameter rotating at 1750 rpm using grease bound abrasive compound. Tube is moved past the brush face by a drive mechanism which rotates the work so that all surfaces receive even finishing. Tube rotates in a clockwise direction against the brush movement.

Brushing time for each tube is 45 seconds; in subsequent operations it is shaped and formed. Polishing operation on the curved surfaces is done by operators on floor stands with the same type of wheel. Action of the brushing is that of blending imperfections and surface irregularities, rather than the actual removal of metal.

Reducing surface imperfections insures a good plating job which is pleasing to eye and touch. Sharp edges or groove-like marks which are emphasized in plating, have been shown to be almost entirely eliminated by examination of the surface finish by a Brush surface analyzer. The finished brushed surface is such that a uniform plating will result.

Exact Metallurgical Control of Aluminum Alloy Macrostructure Eliminates Warpage

WARPAGE of large aluminum alloy heat treated sections while machining has heretofore been a problem long listed as unsolved. The aircraft industry has been haunted by this phenomenon in the machining of long and heavy extruded spar caps for wing sections.

It has been found that the distortion is caused by nonuniform residual stresses from heat treatment associated with a heterogeneous crystal structure consisting of elongated grains, varying in size across the section (see the top macrograph below).

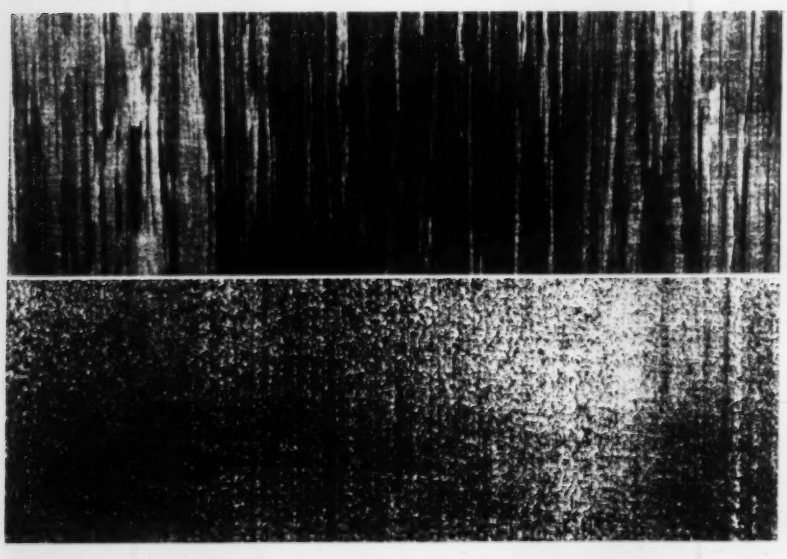
This research, conducted by metallurgical department of Harvey Machine Co. Inc., Los Angeles, has shown that these stresses vary in magnitude across the fibers and, as layers of fibers are removed in machining, stress relieving occurs, causing movement.

No Distortion—Working with a major aircraft company, results of metallurgical studies on the relationship of crystal structure to warpage were made available in sample lots of 14S-T6 spar sections. It was found that the extrusions produced using special metallurgical practices exhibited no significant distortion after machining.

On the basis of the studies, all future procurements of extruded shapes of this alloy which are to be machined on one or more surfaces and used in lengths over 30 inches are specified to have a similar structure. Grain structure is to be fine and completely recrystallized, with uniform size distribution throughout the cross section (see bottom macrograph below).

It is reported that extruded bars and rods in heat treated strong aluminum alloys respond in a similar manner to that of the aircraft wing spar sections. A macrostructure consisting of uniformly small grains has proved that it results in minimized distortion during machining operations, the company reports.

Macrographs of aluminum with heterogeneous crystal structure with elongated grains varying is size across section (top) and with fine grain structure and completely recrystallized with uniform size distribution from special practices (bottom). Both macrographs 1X



Hot Spot Machining Described

Reasoning that tool failure is the mechanicaly inability of a heated tool to withstand the shear force and resistance to plastic deformation of a cold workpiece led Sam Tour & Co., New York, to join forces with the Navy Department's Bureau of Ships in research to reduce the shear force by heating workpiece just ahead of the cutting operation.

The series of tests conducted were directed to finding whether the energy consumed, time involved and results achieved in the machining of metal stock could be substantially improved by heating the work rather than by cooling the tool.

According to an Office of Technical Services report, PB 99978, tests run to date indicate that hot machining will be a "vital contribution to machining methods." According to the report, a special application alloy formerly classed as unmachineable, may be readily machined by this method. Desirable metal removal rates have been estimated to be 3 to 200 times faster than possible with machining at room temperatures. For additional information on hot spot machining, see STEEL, Jan. 2, 1950, page 248 and Feb. 27, 1950, page 60.

RWMA Specs Being Reviewed

With the many improvements made in resistance welding in the last few years, all standard specifications drawn up by the Resistance Welder Manufacturers' Association are undergoing review and revision, the institute reports. Completion of new specifications covering spot and projection welders, press type, and spot welders of the horn type have been made.

Specification review and revision work is being carried on under the direction of A. L. Williams of Federal Machine and Welder Co., chair-

man of the association's technical committee. Other Committee members are: Barron D. Berger of National Electric Welder Co.; A. H. Lewis, Swift Electric Welder Co.; Leonard R. Matthews, Arco Welder Mfg. Co.; J. H. Cooper, Taylor-Winfield Corp.; T. Embury Jones, Precision Welder & Machine Co.; H. W. Stieglitz, Thomson Electric Welder Co.; C. F. Kaunitz, Resistance Welder Corp.; and H. V. Beronius Jr. Welding Machines Mfg. Co.

Also functioning is a committee on alloys, with the following representing electrode manufacturers: H. D. Weed of Weiger, Weed and Co. Division of Fansteel Metallurgical Corp., and W. G. Fetter of P. R. Mallory & Co. Inc.

The Latest Copper Standards

Compiled in one volume are 105 standards pertaining to copper and copper base alloy products, available from American Society for Testing Materials, Philadelphia. One section has 20 specifications on copper, copper alloy and copper-covered steel wire, rods, bars and stranded conductors for electrical purposes. Next is a group of 13 specifications on various nonferrous metals such as slab zinc, nickel, silicon copper, lead and others.

Several sections with 61 specifications include copper and copper alloy products such as plate, sheet and strip; wire, rods, bars and shapes; pipe and tubes; sand and die castings; and arc-welding electrodes. Also included are nine test methods covering expansion, mercurous nitrate, resistivity, tension, hardness, sampling and grain size evaluations. Two recommended practices for preparing tension test specimens for copper-base alloys for sand castings and designating significant places in specified limiting values may also be found in the 500-page book.

Stainless Steels Listed

Complete listing of all carbon steel, stainless steel, alloy steel and tubing stocks carried by United States Steel Supply Co., Chicago, are listed in the 1950-51 stock list and reference book recently made available. Several pages are devoted to reinforcing bars and their fabrication, an operation performed at five of the company's plants.

About 75 pages are devoted to machinery and industrial supplies. The 312-page book also includes tables of weights, structural loads, fraction and decimal conversions, steel chemistries and others.

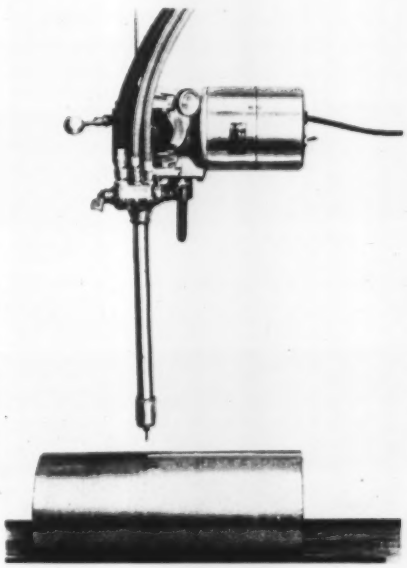
Gun Method Speeds Brazing

DEVELOPED primarily for use on a moving line such as a conveyor system, a new method of brazing and soldering, reported by Metallizing Co. of America, both speeds up production and saves materials while providing a neater job.

Success of the method stems from a so-called gun that feeds brazing or soldering wire at a fixed speed synchronized with the speed of the work piece being processed.

In brazing operations, the unit can be started or stopped instantly, will feed the wire continuously or intermittently as desired. Once in operation, it is practically automatic in performance, the Chicago company says.

Moves with Work—As a rule the gun remains in a fixed position while brazing or soldering. But in some



cases it moves with the work or while the work is stationary. When the unit is set up for brazing, the tube that guides the brazing wire is set in a vertical position. End of the brazing tip is about 1¼ inches away from the surface to be brazed.

Speed of brazing depends on amount of copper required to fill seam, diameter of wire, gage of material, etc. In practice, it is found seams can be made at the rate of 60 to 120 lineal inches per minute.

Power Press Handbook Enlarged

Enlarged to 700 pages and thought to be one of the most complete handbooks ever produced for the press metalworking industry is a power press handbook published by E. W. Bliss Co., Toledo, O.

Included in the text are illustrated sections on primary sheet metalworking operations, types of equipment used to perform these operations, tables of useful information, methods of computing press capacity and blank size for many types of work, how to select the proper press for a given job and a glossary of terms used in the industry. A 400-page section contains operating and maintenance instructions and parts lists for a wide variety of equipment made by the Bliss Co.

Drums Printed Like Magazines

With the installation of new printing press 55-gallon drums are being printed by Rheem Mfg. Co., New Orleans, in much the same manner as many magazines, including STEEL. This lithographing press is capable of printing, individually, any number of colors, without limit, on 50 x 72 inch sheets of 18-gage steel which are to be formed into 55-gallon drums.

In addition to printing on the outside of the drum, the new press, made by R. Hoe & Co., New York, is said to handle the top of the container in the same way, besides roller-coating the inside surface with lacquer to protect its contents from foreign matter, should this be desired. Specially formulated linings can be applied to meet requirements for products which are corrosive and hard to contain.

Steel used is about 1/20 of an inch thick and weighs approximately 2 pounds to the square foot. Press can handle steel sheets from 24 x 42 up to 50 x 72 inches, with a gage range from 24 to 16.

44 Years and Still Running

A lot of water has passed by a water wheel generator at Ephraim City, Utah since it was installed 44 years ago. Made by General Electric Co., Schenectady, N. Y., the machine was run 16 hours a day for the first 5 years after its installation in 1906. In 1911 it was put into round-the-clock operation and has been giving almost continuous service ever since, the light plant reports.

The only shutdown experienced was for oiling and cleaning and replacing of the commutators on the exciter in 1922 and for maintenance of the water wheel when it had to be shut down for changing buckets. Driven by a 32-inch diameter impulse wheel, the machine has delivered as high as 200 kw for peaks that lasted approximately 1 hour. Original bearings, coils and other components are still in use.

In spite of an overflow in 1909

which flooded the plant with muddy water to a depth of about 1 foot, the generator continued to operate. A broken stream deflector on the water wheel allowed the machine to go at runaway speed for an hour in 1911 before the operator could shut it down. Despite this severe operation, only damage to the generator was that the external leads were burned. The machine, rated at 21.6 amp, 600 rpm, 4000 volts, is expected to continue in service.

Bar Standard Revision Offered

Current revision of simplified practice recommendation R26-49, steel reinforcing bars, proposes that the recommendation shall consist of a bar number and the weight in pounds per foot for each of the 10 sizes of bars included, ranging from 0.05 to 1.56 square inches in cross-sectional area. Numbering system is based on the number of eighths in an inch in the nominal diameter of the bars. Weight per foot to calculate the equivalent cross-sectional area of deformed bars provides a uniform method for all styles of deformations.

Copies of the revision have been submitted to those interested for acceptance or comment, according to Commodity Standards Division, National Bureau of Standards, Washington, D. C. Revision is based on recommendations of the committee on reinforced concrete research, American Iron and Steel Institute.

Thermocouple 9 Times Faster

Speed responses up to nine times that of previous models is claimed for new thermocouples developed by Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia. Increased response speed has been made possible by reducing the mass of the hot junction in the 8, 14 and 20-gage types, shaping the thermocouple wire to form a loop close to the hot junction and furnishing metal-to-metal contact, eliminating dead air space, by having the loop fit tightly inside a well.

Can Lift 25 Tons

Capable of working with 130 feet of boom and having a lifting capacity of 25 tons on outriggers at a 10-foot radius are two Lorain Moto-cranes, made by Thew Shovel Co., Lorain, O. Turntable is powered by 6 cylinder gasoline engine, power being delivered through a Twin Disc hydraulic coupling. The model MC-504 and MC-504W are available with 100-foot crane boom, 15 and 30-foot boom extension, 3-sheave boom head, 2 lengths of shovel booms, clamshells, dragline and hoe.

Turntable and cranes may be mounted on either of two carriers: A wide track model consisting of a three-axle carrier, 118 inches wide over rear tires, with driving power applied to two rear axles. A front driving axle may be installed. The other model is the same except for a narrower width of 102 inches over rear tires and availability with power on two rear axles only. Both have ten speeds forward and two in reverse plus Bendix-Westinghouse air brakes on all rear wheels. Air-assist steering greatly reduces driver effort.

Conduit Standard Announced

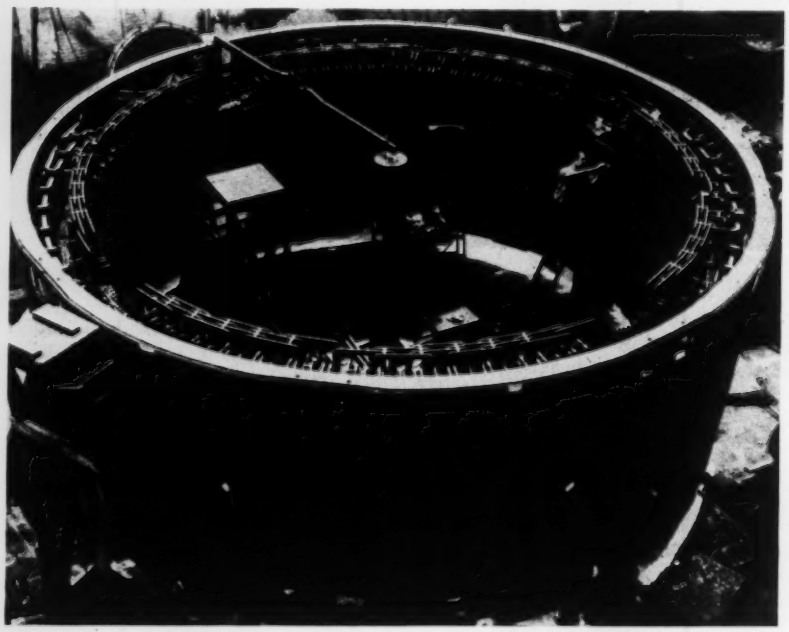
Standard specifications for zinc coated and enameled rigid steel conduit and zinc coated electrical metallic tubing, used as raceways for electric wiring and cables, are announced by American Standards Association, New York. Purpose of the new standard is to establish uniform dimensions and standard construction requirements for these products.

Standard includes sizes in general use and detailel requirements for coatings, threading, identification, couplings, elbows and nipples, tests for ductility, thickness and quality of coating and inspection procedure. An appendix includes a referee test method for determining thickness of coating on rigid steel conduit, zinc coated and electrical metallic tubing. Test is to be used in case of disagreement regarding suitability of the thickness or extent of the external zinc coating.

Saving by Belt Grinding

Designed to cut costs on many secondary and clean-up operations is an abrasive belt grinder which can be used for free belt operation, form wheel work, contour grinding, line contact grinding for hogging operations or for platen precision grinding either above or below.

Use may be to deburr, remove cutter marks, break corners, etc., or with automatic feeding, for cleaning up jobs between cycles of an automatic machine. Abrasive unit, made by Abrasive Machine Co., Naperville, Ill., is mounted on an axis which centers at the motor shaft. With one turn of a clamp nut the abrasive belt may be set at any angle in a complete 360 degree arc. Several units may be set above each other so that the contact wheels or platens may be directly in front of the operator. With this set-

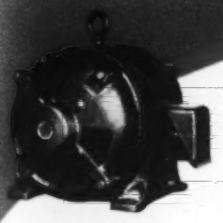


SO ROUND, SO POWER PACKED: Shown using a pin gage to check the stator for roundness prior to mounting the end bracket are these workmen doing their part in the building of a 66,700 kva waterwheel generator for the Seattle, Wash., power plant on the Skagit river. It will join three other generators, like this one, built by Westinghouse Electric Corp., Pittsburgh. When completed, this unit will weigh 580 tons, stand 21 feet high and 36 feet in diameter. The 287-ton rotor will turn at a speed of approximately 164 rpm

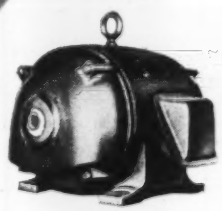
There's a Century MOTOR To Supply Dependable Power For All Popular Applications

Century motors are available in sizes from 1/6 to 400 horsepower, in a wide range of types and kinds — single phase and polyphase alternating current, and direct current. All of them are ruggedly built to assure top performance throughout a long service life.

POLYPHASE

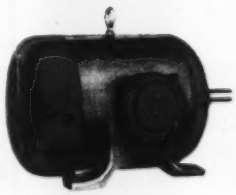


Type SC—OPEN PROTECTED—Form J, general purpose motor—meets the needs for most installations where operating conditions are relatively clean and dry. The top half of the motor frame is closed to keep out falling solids or dripping liquid.

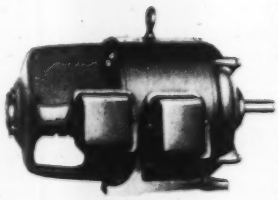


Type SC—SPLASH PROOF—gives the necessary protection where plants must be washed down—keeps water out of the motor even when a hose is applied directly on the frame. Also provides protection against rain, snow, sleet and ice for outdoor installations.

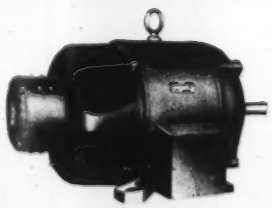
Type SC—TOTALLY ENCLOSED FAN COOLED—protects against dusts, mist or fog detrimental to the vital parts of the motor. The inner frame protecting the motor is sealed to keep out harmful matter.



Type SC—EXPLOSION PROOF—protects against atmospheres charged with explosive dusts or gases. They carry Underwriters' label for specific kinds of hazards.

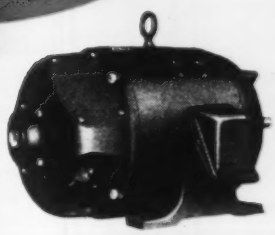


Type SR—SLIP RING—wound rotor motors are suitable for applications requiring low starting current with high starting torque, reversing, or adjustable speed.

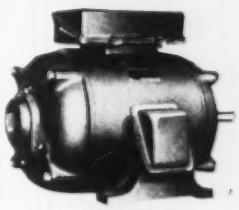


Type SY—SYNCHRONOUS MOTORS—suitable for continuous operation at a uniform load for power factor correction.

SINGLE PHASE



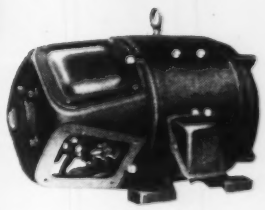
Type RS—REPULSION START INDUCTION—single phase brush lifting motor suitable for applications requiring high starting torque with low starting current.



Type CSH—CAPACITOR START INDUCTION—single phase motor suitable when high starting torque with normal starting current is required.

Type SP—SPLIT PHASE, INDUCTION—single phase motors—suitable for light starting duty.

DIRECT CURRENT



Type DN—DIRECT CURRENT MOTORS—suitable for use where direct current is available or its use desirable.

These illustrations are typical of Century's complete line of motors. Others available include gear motors, generators, AC and DC motor generator sets.

Specify the right Century motor for all your electric power requirements.

Popular types of standard ratings are generally available from factory and branch office stocks.

CENTURY ELECTRIC COMPANY

1806 Pine Street
St. Louis 3, Missouri

Century C MOTORS

645

Offices and Stock Points in Principal Cities

up, it is said that a worker can rough, semifinish and finish grind with little waste movement.

Happy Jack Plays the Lead

How to handle and unload freight safely is the subject of a new training film available from National Safety Council, Chicago. Playing the lead, a character named Happy Jack shows the safe way to open a freight car door, lower a dock plate into position and anchor it, and how to handle sleepers. Developed in the lighter vein, the film is available in 35 mm sound slidefilm and 16 mm film for sound-motion projectors.

Conveyor Feeds Conveyor

Making use of a subassembly belt conveyor to automatically feed a main cable type overhead trolley conveyor has enabled a manufacturer of temperature control to affect a considerable savings in manual handling. A steady flow of production parts is assured.

Subassembly parts arrive on the belt conveyor and "stack up" behind a positioning electric stop. Trolley hooks which are already loaded are deflected by a baffle plate. Empty hooks enter the guide and pick up one of the waiting parts; the line of parts then moves up, ready for the next hook.

Prior to the transfer point, the cable trolley conveyor, made from stock parts at E. W. Buschman Co., Cincinnati, comes down from the ceiling; after the transfer, the cable conveyor inclines steeply to the ceiling to clear the aisle space. At assembly points it returns to the operator's working level.

Precast Concrete Cuts Cost

Winter, which often stops or seriously hampers construction of industrial plants, scarcely affected Wigton-Abbott Corp., Plainfield, N. J., in the building of a 17-acre plant for Continental Can Co., West Mifflin Borough, near Pittsburgh.

Seeing its first use on a large scale was a system of precasting concrete foundation grade beams and curtain walls. Net affect of the new technique was to speed construction and considerably lower construction costs.

All precasting was done on the site; curtain wall slabs and foundation grade beams were formed by pouring concrete on a flat, treated concrete surface with removable edge forms. Steel inserts in the concrete facilitated handling and setting of the slabs and beams and assisted in the fastening of steel columns, which were set on 20-foot centers in conventional, poured concrete footings.

Winter Howls in Vain—In order to have matched the speed of the precasting process with conventional poured-in-place construction, it would have been necessary to erect large areas of form work at a time when the operation would have been subject to interruption by uncertain winter weather conditions. By precasting during the winter, the company avoided the cost of conventional protection and heating, plus the delays due to inclement weather.

It is reported that the savings made by elimination of the conventional form work considerably outweighed the cost of handling and setting the precast concrete. It was also found that the desired surface finish was readily obtained. The office section facade of the plant has fluted aluminum panels on the spandrels, flat aluminum panels on the pilasters and is two stories high. When fully completed, the plant will have a floor area of about 700,000 sq ft in the one-story combination manufacturing and warehouse structure.

CALENDAR OF MEETINGS

† *Denotes first listing in this column.*

Aug. 28-31, American Mining Congress: 1950 Metal Mining Convention and Exposition, Salt Lake City, Utah. Headquarters of AMC: Ring Bldg., Washington 6, D. C.

Sept. 5-9, American Chemical Society: National Chemical Exposition, Chicago Coliseum. Sponsored by Chicago Sections, ACS, 86 E. Randolph St., Chicago 1.

Sept. 11, Society of Automotive Engineers: Tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 11, Society of Automotive Engineers: Aeronautical meeting and aircraft engineering display, in Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Sept. 13-15, Porcelain Enamel Institute: Twelfth Annual Forum, University of Illinois, Urbana, Ill. Institute is located at 1010 Vermont Ave., N. W., Washington 5, D. C.

Sept. 13-16, National Association of Foremen: 27th annual convention, Statler Hotel, Buffalo, N. Y. Association headquarters: 321 W. First St., Dayton 2, O.

Sept. 18-22, Instrument Society of America: Instrument conference and exhibit, Memorial Auditorium, Buffalo, N. Y. Society headquarters are at 921 Ridge Ave., Pittsburgh 12.

Sept. 19-21, American Society of Mechanical Engineers: Fall meeting, Hotel Sheraton, Worcester, Mass. Society headquarters at 29 W. 39th St., New York 18.

Sept. 23-26, Packaging Machinery Manufacturers Institute: 18th annual meeting. The Homestead, Hot Springs, Va. 342 Madison Ave., New York 17, is address of institute.

Oct. 2-6, Gas Appliance Manufacturers Association: Biennial exposition, Convention Hall, Atlantic City, N. J. Association headquarters: 60 E. 42nd St., New York 17.

Oct. 5-6, American Foundrymen's Society: Regional conference, Plaza Hotel, San Antonio, Tex. Sponsored by Texas chapter, AFS, with headquarters at 5210 Canal, Houston.

Oct. 5-6, Porcelain Enamel Institute: 4th annual sales and management conference, Hotel Cleveland, Cleveland. Institute headquarters: 1010 Vermont Ave. N. W., Washington 5, D. C.

Micro-Bushings Standardized

Standardization has been applied to a line of over 1700 types of micro-drill jig bushings and liners for all types of small hole drilling operations. Micro Drill Guide & Engineering Co. of Detroit is making available a line of bushings for micro drills from No. 80 (0.0135-inch) to No. 42 (3/32-inch). Four standard body sizes of 3/32, 1/8, 5/32 and 3/16-inch and liners for these sizes are also included in the line made available.

Use of bushings is said to eliminate the distortion of guide holes as it permits use of plates made of soft steel or other materials. Increased micro-drill life is attainable through use of the micro guide because of the trueness and concentricity with which the drill turns in the bushing. It is reported that spindle vibration and inaccuracies of chucking are virtually eliminated by the guide.

Head type guides are available as standard in slip fit, press fit or oversize with grinding stock for fitting. Heads are recessed to receive a conventional locking screw and are not counterbored, the drill bearing bore extending up to head end chamfer.

Solder Has Many Uses

Applied like putty and hardening like metal is Fixx, a cold solder introduced by H. K. Porter Inc., Somerville, Mass. It can be ground, filed, sanded, polished and painted and is nonshrinking, nonrusting, waterproof and flexible. Possible uses are for sealing, waterproofing, patching, caulking, resurfacing, and filling on tanks, pipes, patterns, castings and machinery. Also made available is Fixx-Fab, a fabric which acts as a filler and a support for cold solder in larger areas.

Makes Electrical Tubing

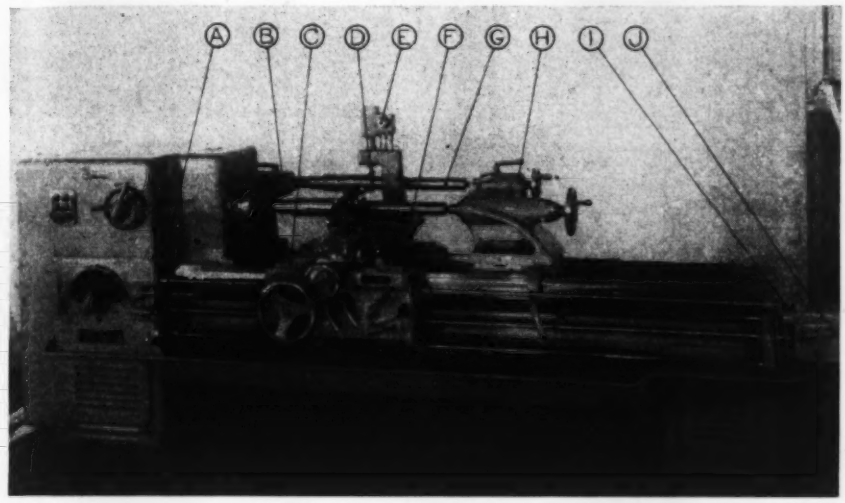
New electric resistance weld tube mill installed at the Etna, Pa. of Spang-Chalfant Division, National Supply Co., is producing electrical metallic tubing. Product is finished with an electro-galvanized exterior finish and elastic enamel coating on the interior. Known as Central tubing, it is made in sizes from ½ to 2 inches and in standard 10-foot lengths.

UNIVERSITY OF MICHIGAN LIBRARIES

New Products and Equipment

Tracer Attachment for Lathes

Sidney Machine Tool Co., Sidney, O., is producing a fluid tracer which may be used with all models of Sidney lathes and which performs by tracing from a master as well as permitting regular lathe work. There are no moving parts to put on or take off when a change-over is necessary. To use tracer, master work-piece G,



either round or flat, is placed in position between centers of auxiliary headstocks. Three-way valve C which controls forward and reverse rapid traverse and feed to the cross slide of tracer head. The tracer is then ready to trace from the master G to the work-piece F.

Hydraulic pump unit is located at rear of lathe. Two opposed tailstocks B and H support template. Rate of feed to the tool is controlled by valve E. Valve I regulates flow of oil and syncronizes disengagement of longitudinal feed clutch with rate of cross slide travel. Lever J chooses type of operation. Lever A controls operation of either lead screw or feed rod. Stylus D controls longitudinal feed and direction of cross slide travel, starting and stopping.

Check No. 1 on Reply Card for more Details

Speed Reducers More Rigid

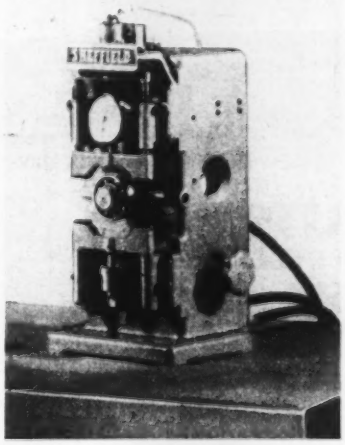
Falk Corp., Milwaukee 8, Wis., is introducing two speed reducers with steel housings providing more rigidity and greater strength. Designed for a wide variety of power transmission requirements, both are rated according to standards of American Gear Manufacturers Association. Type C concentric shaft speed reducer has output speeds from 1 to 1170 rpm and input speeds to 1750 rpm and higher if necessary. Minimum ratio range is 1.5 to 1 and maximum is 970 to 1. Approximate horsepower range is 1 to 50 hp. Mechanical efficiency is 96 to 98½ per cent at full load and is constant during entire gear life.

Type CB horizontal or vertical right angle speed reducers have output speeds from 1 to 350 rpm and input speeds up to 1750 rpm. Mechanical efficiency is 96 to 98½ per cent at full load, depending upon number of gear trains. Ratio range is a minimum of 5.7 to 1 and maximum of 515 to 1. Horsepower range is 1 to 50.

Check No. 2 on Reply Card for more Details

Measures Bearing Clearance

Production measuring of the radial internal clearance of ball and roller bearings is possible with a gaging instrument developed by Sheffield Corp., Dayton 1, O. Readings are



direct, without the use of masters and are repetitive. Instrument can be used to spot check in conjunction with the Sheffield Selectionaire for matching races and balls (see STEEL, May 29, p. 73), to obtain a predetermined amount of internal radial clearance.

Bearing is placed on a horizontal arbor of a size corresponding to the internal diameter of the inner ring, with outer ring floating both axially and radially. Two operations of a foot pedal cause bearing to be loaded successively upward and downward. Movements of outer ring are shown on a tenth dial and the difference between two readings represents the amount of radial play with bearing in that position. Measurement is not affected by wear on the arbor. It is flexible enough to check a variety of sizes and styles of bearings.

Check No. 3 on Reply Card for more Details

Punches ½-Inch Steel

Split punches which eliminate the tremendous stripping pressure and oversize stripping springs make it possible for Wales type G hole punching units to punch holes in ½-inch thick mild steel. Made by Wales-Strippet Corp., 345 Payne Ave., North Tonawanda, N. Y., the three-piece split punch collapses sufficiently to free itself from the wall after punching the hole. This makes possible a light duty spring for stripping.

Units are self-contained and interchangeable and may be set up on templates or T-slotted plates in stamping presses and press brakes. Holders automatically keep the split punch assemblies and dies in alignment. Maximum punch diameter is 1 inch, minimum is ½-inch. Throat depths available are 4, 8 and 12 inches.

Check No. 4 on Reply Card for more Details

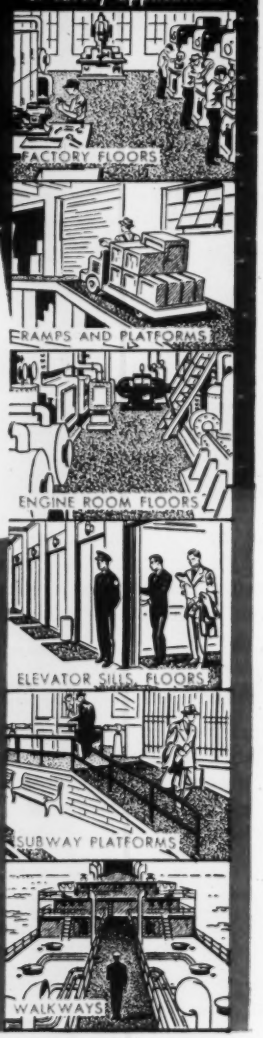
Truck Features Maneuverability

Compactness and maneuverability resulting from reduced overall width and increased speed are features of the 3000-pound capacity electric Carloader fork-lift truck, developed by Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. Unit has automatic acceleration through a master power-switch regulated by an automatic timer. Steering-gear column directional control lever engages first point of power for either forward or reverse operation. Controls prevent change in direction of travel until motor comes to a full stop.

Safety is insured by simultaneous action of the directional control-lever

Only one rolled steel floor plate gives you complete *anti-skid* protection

A.W. ALGRIP has hundreds of safety applications



It's New, Revolutionary

ALGRIP

ABRASIVE ROLLED STEEL FLOOR PLATE

There's nothing like it, absolutely nothing like A.W. ALGRIP. It's the one and only Abrasive Rolled Steel Floor Plate. A.W. ALGRIP is made by rolling tough abrasive grain (the same type used in grinding wheels) as an integral part of the upper portion of steel floor plate. Result: A floor plate that's truly non-slip even when wet or on steep inclines. It keeps men's feet safe and secure.

Because Algrip is rolled steel, it is stronger than other abrasive floorings and withstands severe punishment without cracking or chipping. Then, too, thinner sections may be used without reducing load carrying capacity.

Get complete information about A.W. ALGRIP now. Write or use the coupon for a FREE copy of our 8-Page Catalog.

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A.W. ALGRIP ABRASIVE ROLLED STEEL FLOOR PLATE

A Product of **ALAN WOOD STEEL COMPANY**

CONSHOHOCKEN 18, PA.

Gentlemen: *Please rush me complete information and a FREE copy of your 8-PAGE A. W. ALGRIP Booklet.*

Name _____ *Title* _____

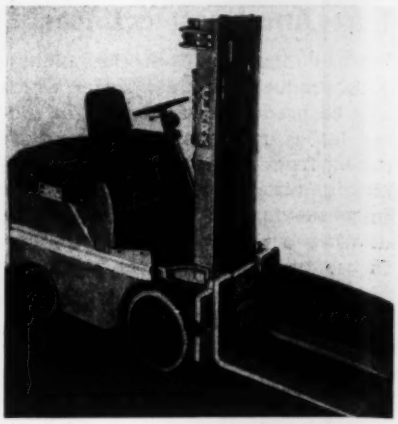
Company _____

Street _____

City _____ *State* _____

Other Products: PERMACLAD Stainless Clad Steel • A.W. SUPER-DIAMOND Floor Plate • Billets Plates • Sheets • Strip • (Alloy and Special Grades)

lock and a "dead-man" brake. A separate motor powers the hydraulic pump which provides lifting and tilting power. Lift heights are available

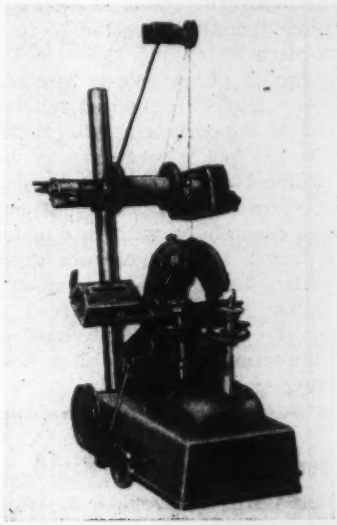


in a range from standard 84 inches with overall height of 61 inches with forks down to 130 inches and an overall height of 84 inches. Hi-Lo-Stack uprights are optional.

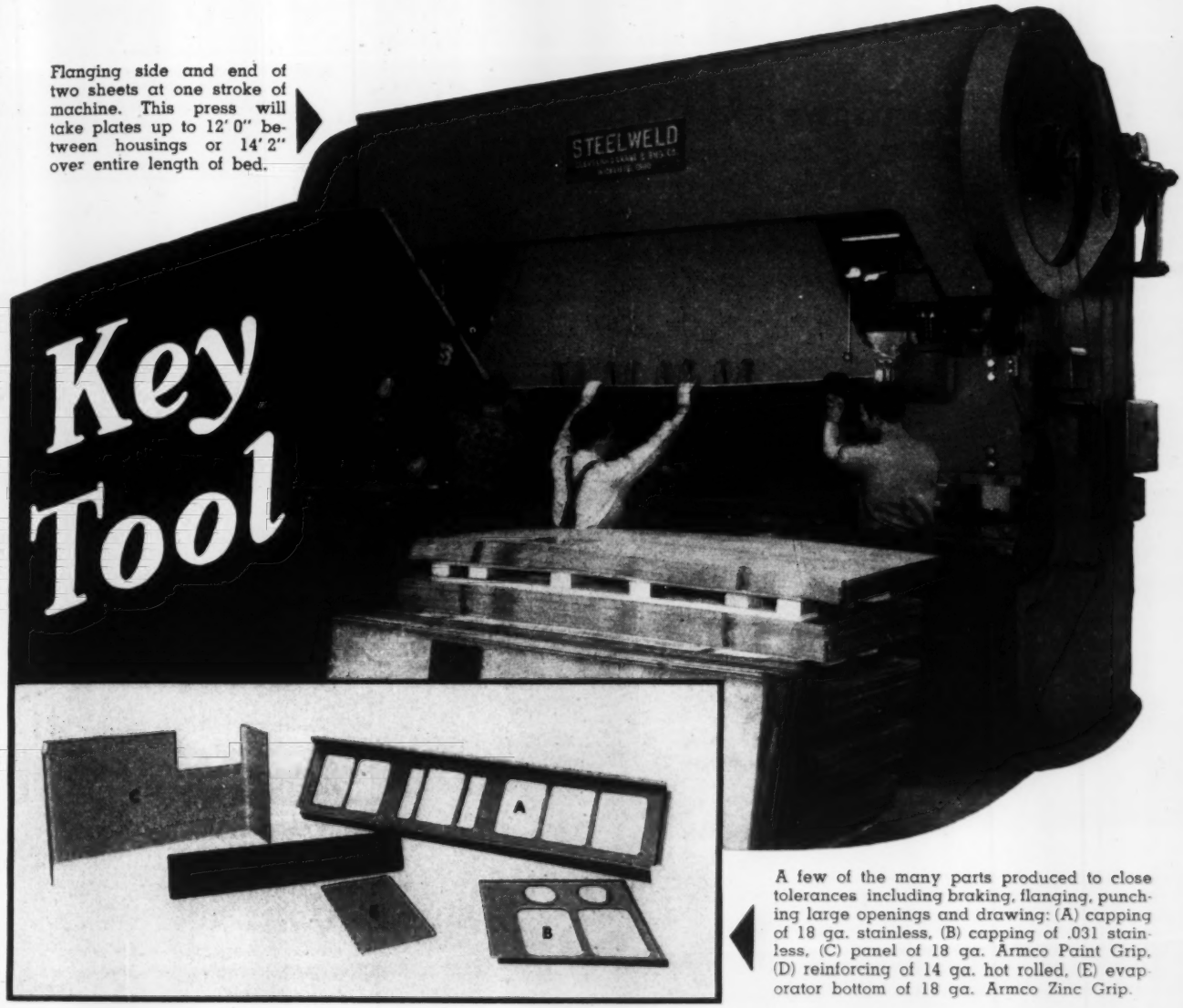
Check No. 5 on Reply Card for more Details

High Speed Coil Winding

Developed for either high speed continuous winding around the entire core or sector winding up to 270 degrees is the toroidal coil winding machine with coil supports, offered by Cosa Corp., 405 Lexington Ave., New York 17, N. Y., representatives of Micafil Ltd., Zurich, Switzerland. It automatically winds coil wire around toroidal or sector cores, placing each strand closely and neatly next to another or accurately spacing them as desired. Shuttle has large wire storing capacity. Motor has stepless adjustment of angular feed during operation. Winders are made in three sizes, making it possible to wind coils to the following finished sizes: Maximum outside diameter



Flanging side and end of two sheets at one stroke of machine. This press will take plates up to 12' 0" between housings or 14' 2" over entire length of bed.



Key Tool

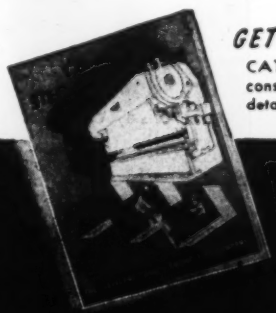
A few of the many parts produced to close tolerances including braking, flanging, punching large openings and drawing: (A) capping of 18 ga. stainless, (B) capping of .031 stainless, (C) panel of 18 ga. Armco Paint Grip, (D) reinforcing of 14 ga. hot rolled, (E) evaporator bottom of 18 ga. Armco Zinc Grip.

IN MANUFACTURING SODA FOUNTAIN EQUIPMENT

A STEELWELD Model K5-12 Press is a key tool at Liquid Carbonic Canadian Corp., Ltd., Montreal, and has an important role in the production of ice cream cabinets, soda fountain equipment, tanks and containers.

The press is used for various parts made of metals such as mild steel, copper, monel, stainless steel and a number of alloys. The work includes bending, forming, beading (such as tops of stainless steel kettles with reinforcing rod inserted), punching large holes and drawing operations.

Parts are usually run through in small lots of 50 to 500. This necessitates frequent die changes, but because of the ease of doing this work on a Steelweld Press, little production time is lost. The machine is in operation 50 hours per week.



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NEW . . . . . Size-marked Engineered Hex Keys

Key size, and corresponding socket set and cap screw sizes, are clearly stamped on the arm of Parker-Kalon Engineered Hex Keys. P-K Hex Keys are again available in attractive, compact steel cases with easy-to-use key island (Set No. 111), and in durable plastic pouches (Set No. 45).

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STRIPPER BOLTS • PIPE PLUGS • HEX KEYS • AVAILABLE EVERYWHERE THROUGH ACCREDITED DISTRIBUTORS

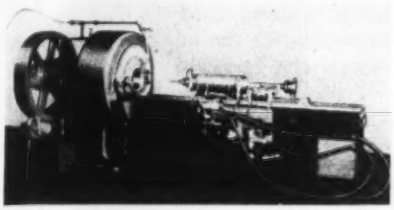
*TRADE MARKS REG. U.S. PAT. OFF. †U.S. DESIGN PAT. NO. 126,409

from 3⅛ to 8 inches; minimum outside diameter from 1¼ to 2¾ inches; coils with circular cross sections with minimum inside diameter from 9/16 to 1⅝ inches and maximum height from 2 to 4½ inches; coils with rectangular cross sections with minimum inside diameter and maximum height range from ⅝ x ¾ inches to 1⅜ x 2 inches. Wire sizes of 23-38, 18-32 and 10-28 AWG may be handled by the three machines.

Check No. 6 on Reply Card for more Details

Machine Swages Harder Steel

Considerable savings of material are realized through the use of a swaging machine featuring special dies which will operate on harder and tougher steels in length-to-diameter ratios. Produced by Fenn Mfg. Co., Hartford, Conn., the swager reduces material requirements by as much as one half. On one particular job, 4½-inch blanks were lengthened by the swager in tapering operations to 9 inches, three cycles being required. Blanks are fed hydraulically and the dies are oil cooled.



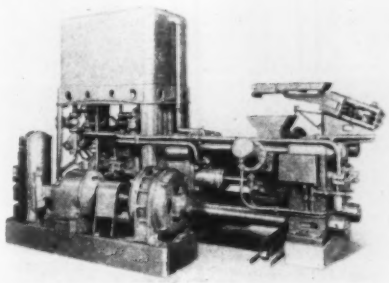
Benefits obtained from swaging include: Improved physical and metallurgical characteristics of the material through a denser structure; alloys can be cold formed which otherwise have to be hot forged; swaging imparts a high finish to the material; less skill is required to operate the machine; and distortion during subsequent heat treating is equal or less than that produced by other methods.

Check No. 7 on Reply Card for more Details

Turnings Into Briquettes

Available in five sizes for converting low-grade bulk metal turnings, borings and chips into dense cylindrical metal blocks are Milwaukee briquetting presses, available from SPO Inc., 6494 Grand Division Ave., Cleveland 5, O. By means of this conversion process, scrap materials are made suitable for charging directly into a foundry cupola.

Machines will convert steel, cast iron, brass and other metals. All operations are automatically controlled, either hydraulically or electrically. All moving parts are pressure lubricated, with electric and hydraulic systems enclosed. Gray iron briquetting capacities range from ¾ to 3½ tons per hour. Density ranges from 70 to 80 per cent and weight from 3 to 11 pounds, depending upon size desired and type of scrap being converted.



Check No. 8 on Reply Card for more Details

Saves on Drills and Scrap

By combining a motor with double-end armature shaft with a No. 0 Jacobs chuck on one end and a rotary vane compressor on the other end, Dumore Co., Racine, Wis., has developed an automatic drill head for drilling diameters from 0.0135 to 0.18-inch in ferrous or nonferrous metals

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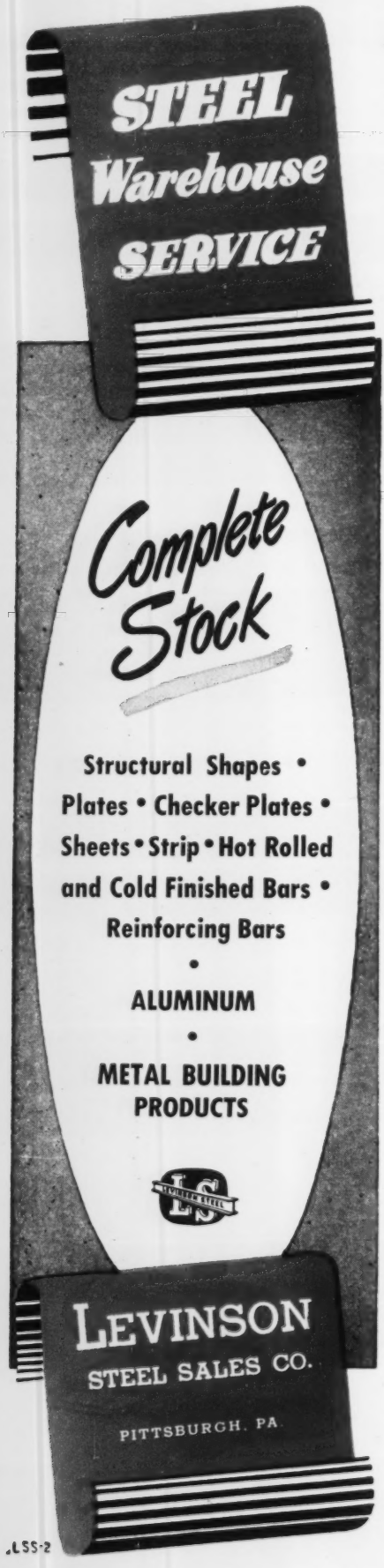


LSS-2

and other materials. The drill head brings about savings in drill breakage and scrap losses. Self-contained air compressor advances drill at a predetermined speed and pressure. Motor speed is controlled by load of the rotary vane compressor which acts as a speed governor.

Drill head operates at usable work speeds varying from 2500 to 7500 rpm, depending on pressure exerted

on the drill. Pressure and feed vary according to drill size. Depth of stroke ranges from 1/32 to 1⅛ inches. Depth can be controlled to within 0.004-inch by adjustable stop nuts. For drilling holes greater than 5 drill diameters in depth, or where chip clogging is apt to occur, unit can be operated manually.

Check No. 9 on Reply Card for more Details

Gages External Threads

All forms of threads may be production gaged externally by a precision instrument available from Han-

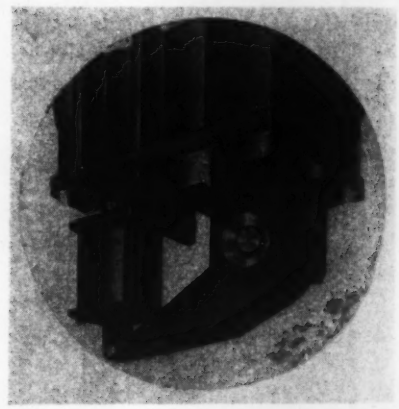
son-Whitney Co., Hartford, Conn. Indicator on the visual thread comparator tells whether the product is oversize, undersize, eccentric, tapered or if lead error exists. Work is recorded visually to accepted ring gage tolerance, eliminating human error.

Capacity covers external threads from 0 through 3⅛-inch diameter, coarse or fine pitches in all classes. Up to 20 pieces per minute may be checked. Three minutes is required to change thread diameter units. Indicator has tolerance hands and is graduated in tenths of thousands to check within 0.0002-inch accuracy. Gaging unit may be easily removed from base for checking parts on the machine.

Check No. 10 on Reply Card for more Details

Protection Against Overload

Available for installation on large mechanical presses made by Clearing Machine Corp., 6499 W. 65th St., Chicago 38, Ill., is an overload safety device, the Loadtrol. It is applied to one end, usually the bottom, of each tie rod and consists of an air cylinder connected by a lever arm through an eccentric pin arrangement in such a way that the tie rod moves a short distance when a predetermined pres-



sure is exceeded. This movement also disengages the clutch by means of an electrical control.

Besides protecting against overload damage, the device makes it possible to preload the tie rods cold in a matter of minutes. As yielding pressure may be adjusted as required, tryouts and settings of dies are simplified. A modification of the same device is offered for protecting the links on the outer slide of a double-action press.

Check No. 11 on Reply Card for more Details

Pump Needs No Lubrication

Designed to deliver ½ cfm, an inlet suction of 4 inches of mercury and an outlet pressure of 1 inch of mercury, is a motor-driven dry air pump, announced by the Aro Equipment Corp., Bryan, O. Designated as model C-

10350, pump requires no external source of lubrication and emits no oil fumes to the atmosphere.

Operation of pump is satisfactory through an ambient temperature range of from minus 65° to plus 140° F. A desiccator installed in the inlet line to dry the air is recommended if pump is to operate under extremely cold conditions.

Check No. 12 on Reply Card for more Details

Electric Tractor Is Shorter

Almost 6 inches shorter than previous models is the driver-led electric Transtractor 101, made by Automatic Transportation Co., 149 W. 87th St., Chicago, Ill. Redesign of power unit housing lowers aisle requirements and reduces turning radius.

Battery is guarded by a solid steel enclosure. Unit is available with couplings at desired heights.

Tractor operates in both speeds, forward or reverse, with the handle upright, this reducing operating space required. It cannot be started in second speed. Brake is on the motor shaft, operating through the entire gear reduction.

Check No. 13 on Reply Card for more Details

Self-Propelled Cranes

Capable of lifting 6 tons at a 10-foot radius with standard counterweight and 10 tons with outriggers extended and auxiliary counterweight is a self-propelled industrial yard lifting crane, developed by Wayne Crane Division, American Steel Dredge Co., Ft. Wayne, Ind. The model 20 rubber-mounted machine will accommodate up to a 39-inch magnet or ½-yard clamshell and dragline buckets in addition to its lifting operation. A single engine, gasoline or diesel, supplies motive and operating power.

Crane will travel, lift, boom and swing simultaneously or independently. Four-point "walking" beam suspension provides stability while lifting or digging on rough terrain. Wheelbase is 7 feet 8 inches and mounting is on four sets of dual pneumatic tires.

Check No. 14 on Reply Card for more Details

Fifth Wheel Trailer

Developed by Market Forge Co., Everett, Mass., is a fifth wheel trailer with a close coupling feature which automatically links the unit 18 inches apart. A locking device keeps the fifth wheel in line and prevents jackknifing when the trailer train backs. Construction is of steel with heavy channels to withstand hard usage.

Rubber wheels roll easily with capacity weight. A 10-inch stainless steel disk is used in the fifth wheel bearing and the turntable and king bolt are pressure lubricated. Axles are removable. Trailers will carry 6000 pounds and measure 36 x 72 inches.

Check No. 15 on Reply Card for more Details

Automatic Control Valve

Pipelines and equipment handling fluid with straight line proportional flow characteristics and minimum pressure drop and turbulence will find use for an automatic control valve developed by W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn. Of the sliding type, the valve opening is rectangular in shape so that the slide or gate is moved over it and flow is directly proportional to the open area. If desired, opening can be designed to conform to any other geometrical figure to provide the kind of flow curve required.

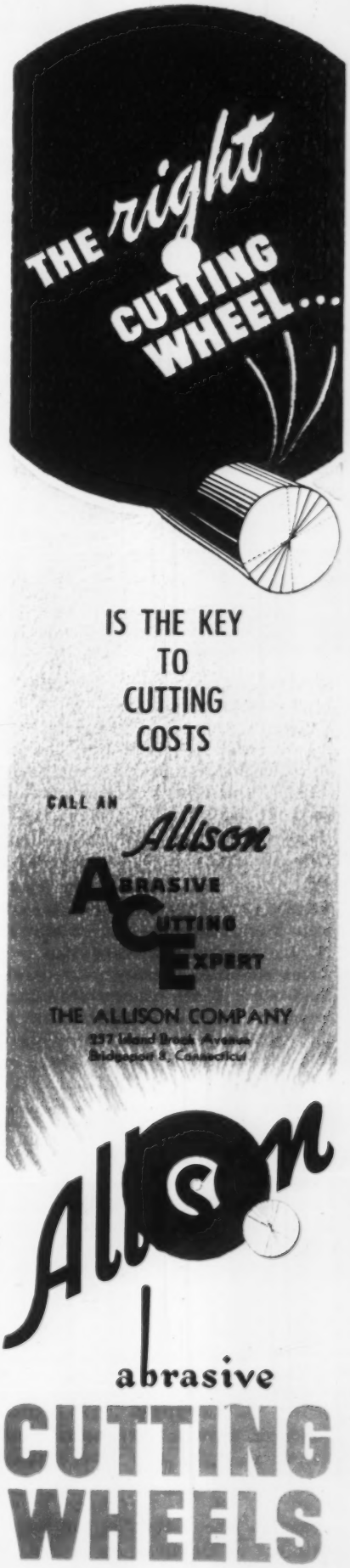
Surfaces of slide or blade and that of body are lapped smooth so that tight contact enclosure is made. Valve body can be of cast iron, cast steel, stainless steel or bronze, while internal working parts are of stainless steel. Unit is built for pipe openings from ¼ to 2 inches and for pressures to 300 psi. Design is such that valve may be actuated by various devices.

Check No. 16 on Reply Card for more Details

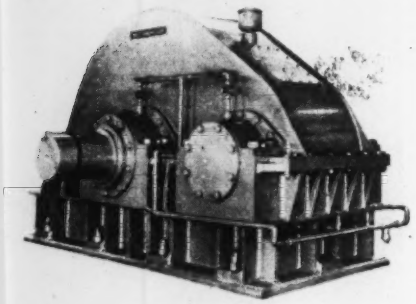
Industrial Speed Reducers

Offered in ratings to approximately 3000 hp are single and double-reduction industrial speed reducers produced by Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Taper-hardened gearing and pinion shafts and fabricated steel housings are used in both WSH and WDH types. These features permit units requiring minimum mounting space and effect savings in weight.

Gearing is of the standard AGMA



hobbed double-helical type, with a high helix angle for smoother operation and less vibration at higher speeds. Gearing of this type minimizes thrust against either case walls or bearings and assures uniform tooth



loading and wear. Antifriction bearings are used throughout, with lubrication by a splash system. Housings are rolled steel sections. Wide flange I-beams, interlocked and welded, provide maximum rigidity.

Check No. 17 on Reply Card for more Details

• • •

FOR HEATING: Series 50 industrial type warm air heaters, made by Arthur A. Olson & Co., Canfield, O., are designed primarily for heating and ventilating industrial and commercial buildings, but can also be used for process work and for make-up air applications.

Check No. 18 on Reply Card for more Details

PRODUCES OXIDATION: Hanson-Van Winkle-Munning Co., Matawan, N. J., introduces a liquid that produces oxidation rapidly. One-fourth fluid ounce of the concentrated liquid is added to each gallon of water for an oxidizing solution for copper, bronze and silver. Solution will not deteriorate.

Check No. 19 on Reply Card for more Details

SHORT STROKE SOLENOID: For heavy duty industrial applications, General Electric's Control Divisions, Schenectady 5, N. Y., offer a new short stroke solenoid that features a cast-permafil coil assembly. Unit is available in four models, including strokes of 1/8 and 5/16-inch and two stacking thicknesses.

Check No. 20 on Reply Card for more Details

FOR CRISS-CROSS STACKING: Made of Royalite thermoplastic material, the new tote box available from United States Rubber Co., New York 20, N. Y., is formed in one seamless piece. Handles are formed into roll of the upper lip so that the box can be picked up from any side. Designed for criss-cross stacking, there is adequate locking when boxes are stacked.

Check No. 21 on Reply Card for more Details

HANDLES CABLE REELS: Reelift, announced by HyKon Mfg. Co., Alliance, O., handles large cable reels up to 2000 pounds. When mounted reel revolves easily on the axle and cannot get away or upset. It is available in two models.

Check No. 22 on Reply Card for more Details

CONTROLS TEMPERATURE: Assembly Products Inc., Chagrin Falls, O., offer Simplytrol bearing temperature safety control that gives remote indication of bearing temperature. It provides an automatic alarm or machine shut down in case of over temperature or corrective factors may be automatically applied.

Check No. 23 on Reply Card for more Details

PLASTIC PIPE: Carlon L plastic pipe, developed by Carter Products Corp., Cleveland 5, O., from a copolymer base is recommended for use in air lines in industrial plants as well as for transmission of liquids, vapors and gases under moderately high pressure. Molded standard pipe fittings of plastic are available and sleeve type connectors can be used for straight piping requirements.

Check No. 24 on Reply Card for more Details

HAND TACHOMETER: Type 25D electric hand tachometer, announced by Metron Instrument Co., Denver 9, Colo., is available with new speed measuring ranges: 100-1000, 200-2000 and 500-5000 rpm and fpm; and 10-100, 20-200, 50-500 fpm. These new ranges are suited for speeds encountered in motor and generator testing, process control and maintenance work.

Check No. 25 on Reply Card for more Details

DISPENSES TAPES: Called Scotch brand filament tape hand dispenser, an all metal unit for dispensing lengths of tough tear-resistant filament tapes is offered by Minnesota Mining & Mfg. Co., St. Paul, Minn. It has a razor-sharp cutting edge. A thumb operated trigger presses the cutting blade against the tape to make it cut. When trigger is released, blade retracts. Dulled blades are easily removed.

Check No. 26 on Reply Card for more Details

SCARFING ATTACHMENT: A new pipe scarfing attachment for use with Kinmont universal power unit has been developed by Roylyn Inc., Glendale, Calif. It provides an economical means of accurately cutting or scarfing pipe or tanks while they are being turned by the power unit. Provision is made for vertical and horizontal adjustment of the cutting torch. A protractor dial provides for angular adjustment.

Check No. 27 on Reply Card for more Details

CHECKS SPLIT-THOUSANDTHS: Engineers Specialties Division, Buffalo 8, N. Y., offers the Micro-Gage screens for accurate gaging to split-thousandths. They are supplied as replacement screens to fit all optical comparator sand contour projectors. Screens are available in four styles.

Check No. 28 on Reply Card for more Details

NO TUBING CONNECTIONS: Phase and amplitude errors rising from flexible-tube connection of pressure cells used in dynamic measurement are eliminated in the new flush-mounted cells announced by Sierra Electronic Corp., San Carlos, Calif., by elimination of tubing connections themselves. Cells mount directly in the surfaces upon which measured pressures impinge. Several styles are available.

Check No. 29 on Reply Card for more Details

ELECTRICAL SWITCHES: An expanded line of small size, precision, snap-action electrical switches for industrial use is offered by Exhibit Supply Co., Chicago, Ill. Switching action is independent of the speed of the actuator. Applications include uses as control, limit and safety switches.

Check No. 30 on Reply Card for more Details

REMOVES TRAMP IRON: Nonelectric Alnico Perma-Plate magnets in three magnetic field ranges are available from Dings Magnetic Separator Co., Milwaukee 46, Wis. Type 1, 2 and 3 magnets are designed for removing miscellaneous tramp iron from wet or dry materials in process in order to protect machinery or prevent sparks. Each type is made in 19 standard sizes from 4 inches wide through 72 inches wide and in 2, 4, 6 and 8 pole styles.

Check No. 31 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

CONSUMER pressure for steel shipments was never greater. Apprehensive of early inroads by the military on steel supplies, civilian goods manufacturers are playing all the corners in attemps to build inventories. But not much success attends their efforts with mills booked up as far into the future as they care to go. Threat of a nation-wide railroad strike last week didn't help matters. Despite possible government seizure of the roads, thus averting transportation paralysis such as in Canada, steel buyers intensified procurement efforts, deluging producers with futile requests for stepped-up shipments.

PRODUCTION—Token strikes on railroads serving steel plants at several points last week imparted a touch of realism to the situation. Not only were shipments hampered but production was severely curtailed. In event of a general transportation tieup steelmaking operations and shipments will nosedive. Last week due to the token rail strikes, particularly at Cleveland and Chicago, the national ingot rate dropped 10 points to 90 per cent of capacity, lowest since March when operations were adversely affected by the coal strike. The drop represents production loss of about 190,000 tons.

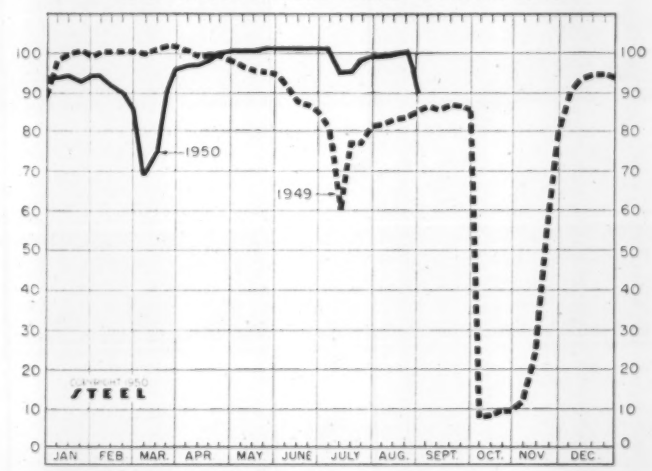
SUPPLIES— Military and related steel requirements will take only a small proportion of total steel output over remainder of the year. Defense officials forecast military needs in fiscal 1950-51 will run to no more than 4 million tons, about 4 per cent of the nation's 100 million ton production potential. Peak consumption year of World War II saw 22.8 million tons or 38 per cent of total steel production going into direct war uses. That was in 1943. These figures are reassuring, but steel buyers, nevertheless, anticipate acute supply shortages in the various products since military demands will cause switches in product mix which will adversely affect supplies and production of certain important products for the general market. For example, conversion of sheet producing facilities to production of plate will cut down supplies of sheets and strip seriously. Both have been in acute supply for months.

DEMAND—With consumers rushing to cover needs before emergency demands further restrict supplies, steelmakers are moving cautiously in booking additional business. Deliveries on all products now extend months ahead and expectations are some tonnage on books will not be shipped until well into first quarter of next year. Carryover tonnage into fourth quarter will necessitate blanking out at least one month's production to care for the overflow. This coupled with rising military demands may force widespread adjustments in established consumer quotas. In fact, some producers already are making such adjustments.

PRICES—Inflationary influences are reflected in continued selective steel product price increases. Only the smaller producers are effecting upward adjustments, the larger interests as yet giving no hint of contemplated advances. Last week Lukens Steel Co. raised stainless clad plates $20 to $30 per ton. Alan Wood Steel Co. increased carbon and alloy plates, hot-rolled sheets and hot-rolled strip $3 per ton. Central Iron & Steel Co. increased its price on floor plates $14 per ton. Elsewhere on the price front no changes of significance were reported though higher prices were reported being paid for foreign pig iron.

COMPOSITES—Scrap prices last week rose to the highest level since early January, 1949. STEEL's composite on steelmaking grades advancing to $42.50 from $40.67. Despite scattered upward revisions on various products, the weighted index on finished steel held at 156.99 as did the arithmetical composite at $94.50. Pig iron composites held steady with No. 2 foundry, $46.85, basic, $45.97, and malleable, $47.49.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Aug. 26	Change	Same Week 1949	Same Week 1948
Pittsburgh	102.5	+0.5*	82	94.5
Chicago	58	—43*	89.5	95
Eastern Pa.	98.5	0	77	92
Youngstown	106	0	90	103
Wheeling	97	+0.5	94	93
Cleveland	65.5	—35.5	96.5	97.5
Buffalo	104	0	98.5	101.5
Birmingham	100	+13*	100	100
New England	87	+2	70	80
Cincinnati	103	0	93	106
St. Louis	89	—2	87	85
Detroit	106	+4	96	99
Western	103.5	+4.5	83	..
Estimated national rate	90	—10	84.5*	96

Based on weekly steelmaking capacity of 1,906,267 net tons for first half and 1,926,803 second half, 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948. *Change from revised rate.

Composite Market Averages

	Aug. 24 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.99	156.99	156.69	152.52	101.85
Index in cents per lb. ..	4.253	4.253	4.245	4.132	2.759
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.50	$94.50	$94.36	$91.55	$58.27
No. 2 Fdry. Pig Iron, GT	46.85	46.85	46.85	46.10	24.67
Basic Pig Iron, GT	45.97	45.97	45.97	45.60	24.00
Malleable Pig Iron, GT..	47.49	47.49	47.49	47.27	25.29
Steelmaking Scrap, GT..	42.50	40.67	37.33	22.17	19.17

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39. Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Aug. 24 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.45	3.45	3.45	3.35	2.25
Bars H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, H.R., del. Philadelphia	3.93	3.93	3.93	3.8164	2.57
Bars, C.F., Pittsburgh	4.10–15	4.10–15	4.10–15	3.95–4.00	2.75
Shapes, Std., Pittsburgh ..	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Shapes, del. Philadelphia..	3.46	3.46	3.42	3.4918	2.215
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa. ..	3.90	3.90	3.60	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del. ...	3.90	3.90	3.60	3.50	2.25
Plates, del. Philadelphia...	3.84	3.69	3.69	3.5848	2.30
Sheets, H.R., Pittsburgh..	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh...	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh..	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh...	3.50	3.50	3.25–50	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh ...	4.15–50	4.15–50	4.15–50	4.00–55	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00–15	2.90
Strip, C.R., Detroit	4.35–95	4.35–95	4.35–95	4.20–25	2.90
Wire, Basic, Pittsburgh ..	4.50	4.50	4.50	4.15	2.75
Nails, Wire, Pittsburgh ...	5.30	5.30	5.30	5.15	2.90
Tin plate, box, Pittsburgh.	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts.(NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT)	58.00	58.00	58.00	60.00	36.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts...	3.85	3.85	3.85	3.40	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47–$50	$47–$50	$47–$50	$47.00	$25.50
Basic, Valley	46.00	46.00	46.00	46.00	24.50
Basic, del. Phila.	50.39	50.39	49.44	49.39	26.34
No. 2 Fdry, Pitts.	49.50	49.50	49.50	46.50	25.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila. ...	50.89	50.89	49.94	49.89	26.84
No. 2 Fdry, Birm.	42.38	42.38	42.38	39.38	21.38
No. 2 Fdry (Birm.)del.Cin.	49.08	49.08	49.08	45.43	25.06
Malleable, Valley	46.50	46.50	46.50	46.50	25.00
Malleable, Chicago	46.50	46.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn. ...	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

*Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt, Pitts...	$46.00	$46.00	$41.00	$23.50	$20.00
No. 1 Heavy Melt, E. Pa. .	41.50	37.50	33.00	19.00	18.75
No. 1 Heavy Melt, Chicago	40.00	38.50	38.00	22.50	18.75
No. 1 Heavy Melt, Valley..	46.25	46.25	40.75	24.75	20.00
No. 1 Heavy Melt, Cleve..	43.25	43.25	38.50	20.00	19.50
No. 1 Heavy Melt, Buffalo.	39.75	39.75	36.75	24.25	19.25
Rails, Rerolling, Chicago..	56.50	56.50	48.50	34.50	22.25
No. 1 Cast, Chicago	49.50	49.00	44.50	39.00	20.00

Coke, Net Ton

Beehive, Furn., Connlsvl...	$14.25	$14.25	$14.25	$13.25	$7.50
Beehive, Fdry., Connlsvl...	15.50	15.50	15.50	15.75	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.00	13.35

NONFERROUS METALS

Copper, del. Conn. 22.50-24.50	22.50	22.50	17.625	12.00
Zinc, E. St. Louis	15.00	15.00	15.00	10.00	8.25
Lead, St. Louis	13.80	12.80	11.80	14.925	6.35
Tin, New York 104.00	101.00	97.75	103.00	52.00
Aluminum, del.	17.50	17.50	17.50	17.00	15.00
Antimony, Laredo, Tex. ..	24.50	24.50	24.50	38.50	14.50
Nickel, refinery, duty paid.	48.00	48.00	48.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	48.00	$48.50	$49.00	$49.50
Brooklyn,N.Y.,del.	....	52.79	53.29	....
Newark,del	50.63	51.13	51.63	52.13
Philadelphia, del.	50.39	50.89	51.39	51.89
Birmingham District				
AlabamaCity,Ala. R2	41.88	42.38	....	....
Birmingham R2	41.88	42.38	....	....
Birmingham S9	41.88	42.38	....	....
Woodward,Ala. W15	41.88	42.38	....	....
Cincinnati,del.	....	49.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda,N.Y., W12	46.00	46.50	47.00	....
N.Tonawanda,N.Y., T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester,N.Y., del.	48.63	49.13	49.63	....
Syracuse,N.Y.,del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary,Ind. C3	46.00	....	46.50	....
IndianaHarbor,Ind. I-2	46.00	....	46.50	....
So.Chicago,Ill. W-14, Y1	46.00	46.50	46.50	....
So.Chicago,Ill. C3	46.00	....	46.50	47.00
Milwaukee,del.	47.89	48.39	48.39	48.89
Muskegon,Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron,del. from Cleve.	48.39	48.89	48.89	49.39
Lorain,O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie,Pa. I-3	46.00	46.50	46.50	47.00
Everett,Mass. E1	....	50.50	51.00	....
Fontana,Calif. K1	52.00	52.50	....	....
Geneva,Utah G1	46.00	46.50	....	....
Seattle,Tacoma,Wash., del.	....	54.20	....	....
Portland,Oreg.,del.	....	54.20	....	....
LosAngeles,SanFrancisco,del. ...	53.70	54.20	....	....
GraniteCity,Ill. M10	47.90	48.40	48.90	....
St.Louis,del. (incl. tax)	48.65	49.15	49.65	....
Ironton,Utah C11	46.00	46.50	....	....
LoneStar,Tex. L6	41.50	*42.00	42.00	....
Minnequa,Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	49.50	49.50	50.00
Pitts,N.&S. sides, Ambridge, Aliquippa,del.	....	50.69	50.69	51.19
McKeesRocks,del.	....	50.45	50.45	50.95
Lawrenceville,Homestead, McKeesport, Monaca,del.	....	50.94	50.94	51.44
Verona,del.	....	51.40	51.40	51.90
Brackenridge,del.	....	51.63	51.63	52.13
Bessemer,Pa. C3	46.00	....	46.50	47.00
Clairton,Rankin,So.Duquesne,Pa. C3	46.00	....	....	....
McKeesport,Pa. N3	46.00	....	....	47.00
Sharpsville,Pa. S6	....	....	46.50	47.00
Steelton,Pa. B2	48.00	48.50	49.00	49.50
Steubenville,O. W10	46.00	....	....	....
Swedeland,Pa. A3	50.00	50.50	51.00	51.50
Toledo,O. I-3	46.00	46.50	46.50	47.00
Cincinnati,del.	51.01	51.51	....	....
Troy,N. Y., R2	48.00	48.50	49.00	49.50
Youngstown District				
Hubbard,O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield,O.,del.	50.26	50.76	50.76	51.26

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson,O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls,N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2	82.00
Wenatchee, Wash., OH & Fdry., frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton,Pa. B2	54.00
Philadelphia delivered	57.00
Troy,N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL Aug. 24, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Fontana,Calif. K1 ....76.00
Munhall,Pa. C3 .....50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Fontana,Calif K1 .....77.00
Houston,Tex. S5 .....59.00
Midland, Pa. C18 ....51.00
Munhall,Pa. C3 .....51.00
So.Duquesne,Pa. C3 ..51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer,Pa. C3 ....$53.00
Clairton,Pa. C3 .....53.00
Conshohocken,Pa. A3. 62.00
Ensley,Ala. T2 .....53.00
Fairfield,Ala. T2 .....53.00
Fontana,Cal. K1 .....72.00
Gary,Ind. C3 .....53.00
Johnstown,Pa. B2 ....53.00
Lackawanna,N.Y. B2. .53.00
Munhall,Pa. C3 .....53.00
So.Chicago,Ill. C3 ....53.00
So.Duquesne,Pa. C3 ...53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 ....$63.00
Buffalo R2 .....63.00
Canton,O. R2 .....63.00
Clairton,Pa. C3 .....63.00
Cleveland R2 .....63.00
Conshohocken,Pa. A3 ..68.00
Detroit R7 .....66.00
Ensley,Ala. T2 .....63.00
Fairfield,Ala. T2 .....63.00
Fontana,Calif. K1 ....82.00
Gary,Ind. C3 .....63.00
Geneva,Utah G1 .....63.00
Houston,Tex. S5 .....71.00
Ind.Harbor,Ind. I-2 ...63.00
Johnstown,Pa. B2 ....63.00
Lackawanna,N.Y. B2...63.00
LosAngeles B3 .....82.00
Munhall,Pa. C3 .....63.00
Seattle B3 .....82.00
So.Chicago C3,R2,W14.63.00
So.Duquesne,Pa. C3 ..63.00
So.SanFrancisco B3 ...82.00

Alloy (NT)
Bethlehem,Pa. B2 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2, T7 ....66.00
Conshohocken,Pa. A3..70.00
Detroit R7 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. C3 .....66.00
Houston,Tex. S5 .....74.00
Ind.Harbor,Ind. Y1 ...66.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....86.00
Massillon,O. R2 .....66.00
Midland,Pa. C18 .....66.00
Munhall,Pa. C3 .....66.00
Sharon,Pa. S3 .....66.00
So.Chicago C3,R2,W14.66.00
So.Duquesne,Pa. C3 ..66.00
Warren,O. C17 .....66.00
Youngstown Y1 .....66.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$76.00
Cleveland R2 .....76.00
Fontana,Calif. K1 ....100.00
Gary,Ind. C3 .....76.00
Ind.Harbor,Ind. I-2 ...76.00
Massillon,O. R2 .....76.00
So.Chicago,Ill. R2 ....76.00
So.Duquesne,Pa. C3 ...76.00

SHEETS BARS (NT)
Fontana,Calif. K1 ....$86.00

SKELP
Aliquippa,Pa. J5 .....3.25
Munhall,Pa. C3 .....3.15
Warren,O. R2 .....3.15
Youngstown C3, R2 ....3.15

WIRE RODS
AlabamaCity,Ala. R2 ..3.85
Buffalo W12 .....3.85
Cleveland A7 .....3.85
Donora,Pa. A7 .....3.85
Fairfield,Ala T2 .....3.85
Fontana,Calif. K1 .....4.60
Houston,Tex. S5 .....4.25
Ind.Harbor,Ind. Y1 ....3.85
Johnstown,Pa. B2 .....3.85
Joliet,Ill. A7 .....3.85
LosAngeles B3 .....4.65
Minnequa,Colo. C10 ....4.10
Monessen,Pa. P7 .....3.85
No.Tonawanda,N.Y. B11.3.85
Pittsburg,Calif. C11 ....4.50
Portsmouth,O. P12 ....3.85
Roebling,N.J. R5 .....3.95
So.Chicago,Ill. R2 .....3.85
SparrowsPoint,Md. B2 .3.95
Sterling,Ill.(1) N15 ....3.85
Struthers,O. Y1 .....3.85
Torrance,Calif. C11 ...4.65
Worcester A7 .....4.15

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.40
Aliquippa,Pa. J5 .....3.40
Bessemer,Ala. T2 .....3.40
Bethlehem,Pa. B2 .....3.45
Clairton,Pa. C3 .....3.40
Fairfield,Ala. T2 .....3.40
Fontana,Calif. K1 .....4.00
Gary,Ind. C3 .....3.40
Geneva,Utah G1 .....3.40
Houston,Tex. S5 .....3.80
Ind.Harbor,Ind. I-2 ....3.40
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.00
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.00
Minnequa,Colo. C10 ....3.75
Munhall,Pa. C3 .....3.40
Niles,Calif.(22) P1 ....4.02
Phoenixville,Pa. P4 ....4.25
Portland,Oreg. O4 .....4.05
Seattle B3 .....4.05
So.Chicago,Ill. C3, W14.3.40
So.SanFrancisco B3 ....3.95
Torrance,Calif. C11 ....4.00
Weirton,W.Va. W6 .....3.40

Alloy Stand. Shapes
Clairton,Pa. C3 .....4.05
Fontana,Calif. K1 .....5.25
Munhall,Pa. C3 .....4.05
So.Chicago,Ill. C3 .....4.05

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.15
Bessemer,Ala. T2 .....5.15
Bethlehem,Pa.(14) B2 ..5.20
Clairton,Pa. C3 .....5.15
Fairfield,Ala. T2 .....5.15
Fontana,Calif. K1 .....5.75
Gary,Ind. C3 .....5.15
Geneva,Utah G1 .....5.10
Ind.Harbor,Ind. I-2, Y1.5.15
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y.(14)B2 5.20
LosAngeles B3 .....5.75
Munhall,Pa. C3 .....5.15
So.Chicago,Ill. C3 .....5.15
So.SanFrancisco B3 ....5.70
Struthers,O. Y1 .....5.15

Wide Flange
Bethlehem,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 .....3.40

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
Munhall,Pa. C3 .....5.10
So.Chicago,Ill. C3 .....5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.20
Lackawanna,N.Y. B2 ..4.20
Munhall,Pa. C3 .....4.20
So.Chicago,Ill. C3 .....4.20
Weirton,W.Va. W6 .....4.20

BEARING PILES
Munhall,Pa. C3 .....3.40
So.Chicago,Ill. C3 .....3.40

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.35
Bessemer,Ala. T2 .....5.35
Clairton,Pa. C3 .....5.35
Cleveland J5, R2 .....5.35
Conshohocken,Pa. A3 ..5.35
Ecorse,Mich. G5 .....5.60
Fairfield,Ala. T2 .....5.35
Fontana,Calif. K1 .....5.95
Gary,Ind. C3 .....5.35
Geneva,Utah G1 .....5.35
Ind.Harbor,Ind. I-2, Y1.5.35
Johnstown,Pa. B2 .....5.35
Munhall,Pa. C3 .....5.35
Pittsburgh J5 .....5.35
Sharon,Pa. S3 .....5.35
So.Chicago,Ill. C3 .....5.35
SparrowsPoint,Md. B2..5.35
Warren,O. R2 .....5.35
Youngstown Y1 .....5.35

PLATES, Open-Hearth Alloy
Claymont,Del. W16 ....4.50
Coatesville,Pa. L7 .....4.80
Conshohocken,Pa. I7 ....4.55
Fontana,Calif. K1 .....5.40
Gary,Ind. C3 .....4.40
Johnstown,Pa. B2 .....4.40
Munhall,Pa. C3 .....4.40
Sharon,Pa. S3 .....4.40
So.Chicago,Ill. C3 .....4.40
SparrowsPoint,Md. B2 ..4.40

FLOOR PLATES
Cleveland J5 .....4.55
Conshohocken,Pa. A3 ...4.55
Harrisburg,Pa. C5 .....5.25
Ind.Harbor,Ind. I-2 ....4.55
Munhall,Pa. C3 .....4.55
So.Chicago,Ill. C3 .....4.55

PLATES (Universal Mill)
Fontana,Calif. K1 ....4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.25

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.50
Aliquippa,Pa. J5 .....3.50
Ashland,Ky.(15) A10 ..3.50
Bessemer,Ala. T2 .....3.50
Clairton,Pa. C3 .....3.50
Claymont,Del. W16 ....3.90
Cleveland J5 R2 .....3.50
Coatesville,Pa. L7 .....3.90
Conshohocken,Pa. A3 ....3.75
Ecorse,Mich. G5 .....3.75
Fairfield,Ala. T2 .....3.50
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.50
Geneva,Utah G1 .....3.50
Harrisburg,Pa. C5 .....4.25
Houston,Tex. S5 .....3.90
Ind.Harbor,Ind. I-2, Y1..3.50
Johnstown,Pa. B2 .....3.50
Lackawanna,N.Y. B2 ..3.50
Minnequa,Colo. C10 ....4.30
Munhall,Pa. C3 .....3.50
Pittsburgh J5 .....3.50
Seattle B3 .....4.40
Sharon,Pa. S3 .....3.50
So.Chicago,Ill. C3, W14.3.50
SparrowsPoint,Md. B2 ..3.50
Steubenville,O. W10 ....3.50
Warren,O. R2 .....3.50
Weirton,W.Va. W6 .....3.50
Youngstown C3, R2, Y1.3.50

PLATES, Wrought Iron
Economy,Pa. B14 .....7.85

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.75
Ashland,lcl(15) A10 ....4.25
Cleveland,cl R2 .....4.10
Warren,O.cl R2 .....4.10

BARS, Hot-Rolled Carbon
AlabamaCity, Ala. R2 ..3.45
Aliquippa,Pa. J5 .....3.45
Alton,Ill(1) L1 .....3.45
Atlanta,Ga. A11 .....3.60
Bessemer,Ala. T2 .....3.45
Buffalo R2 .....3.45
Canton,O. R2 .....3.45
Clairton,Pa. C3 .....3.45
Cleveland R2 .....3.45
Ecorse,Mich. G5 .....3.65
Emeryville,Calif. J7 ....4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.45
Minnequa,Colo. C10 ....3.85
Niles,Calif. P1 .....4.17
N.Tonawanda,N.Y. B11.3.45
Pittsburg,Calif. C11 ....4.15
Pittsburgh J5 .....3.45
Portland,Oreg. O4 .....4.20
Seattle B3, N14 .....4.20
So.Chicago C3, R2, W14.3.45
So.Duquesne,Pa. C3 ....3.45
S.SanFran.,Cal. B3 ....4.20
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Weirton,W.Va. W6 .....3.45
Youngstown C3, R2 ....3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.45
Atlanta A11 .....3.60
Johnstown,Pa. B2 .....3.45
Lackawanna,N.Y. B2 ..3.45
Niles,Calif. P1 .....4.17
Pittsburgh(23) J5 .....3.45
Portland,Oreg. O4 .....4.20
SanFrancisco S7 .....4.00
Weirton,W.Va. W6 .....3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2, T7 .....3.95
Clairton,Pa. C3 .....3.95
Ecorse,Mich. G5 .....4.25
Fontana,Calif. K1 .....4.95
Gary,Ind. C3 .....3.95
Houston,Tex. S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity, Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....5.00
Massillon,O. R2 .....3.95
Midland,Pa. C18 .....3.95
So.Chicago C3, R2, W14.3.95
So.Duquesne,Pa. C3 ....3.95
Struthers,O. Y1 .....3.95
Warren,O. C17 .....3.95
Youngstown C3 .....3.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 .....4.20
Fontana,Calif. K1 .....4.95
Gary,Ind. C3 .....4.20
Youngstown C3 .....4.20

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.20
Atlanta A11 .....5.35
Bessemer,Ala. T2 .....5.20
Bethlehem,Pa. B2 .....5.20
Clairton,Pa. C3 .....5.20
Cleveland R2 .....5.20
Ecorse,Mich. G5 .....5.40
Fairfield,Ala. T2 .....5.20
Fontana,Calif. K1 .....6.25
Gary,Ind. C3 .....5.20
Ind.Harbor,Ind. I-2, Y1.5.20
Johnstown,Pa. B2 .....5.20
Lackawanna,N.Y. B2 ..5.20
LosAngeles B3 .....5.90
Pittsburgh J5 .....5.20
So.Duquesne,Pa. C3 ....5.20
So.SanFrancisco B3 ....5.95
Struthers,O. Y1 .....5.20
Youngstown C3 .....5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 .....4.15
Ambridge,Pa. W18 .....4.15
BeaverFalls,Pa. M12,R2.4.15
Buffalo B5 .....4.15
Camden,N.J. P13 .....4.60
Carnegie,Pa. C12 .....4.15
Chicago W18 .....4.15
Cleveland A7, C20 .....4.15
Detroit P17 .....4.30
Donora,Pa. A7 .....4.15
Ecorse,Mich. G5 .....4.35
Elyria,O. W8 .....4.15
FranklinPark,Ill. N5 ...4.15
Gary,Ind. R2 .....4.15
Hammond,Ind. L2, M13.4.15
Hartford,Conn. R2 .....4.55
Harvey,Ill. B5 .....4.15
LosAngeles R2 .....5.55
Mansfield,Mass. B5 ....4.55
Massillon,O. R2, R8 ....4.15
Midland,Pa. C18 .....4.15
Monaca,Pa. S17 .....4.15
Newark,N.J. W18 .....4.55
Plymouth,Mich. P5 .....4.40
Pittsburgh J5 .....4.10
Putnam,Conn. W18 .....4.55
Readville,Mass. C14 ....4.55
St.Louis,Mo. M5 .....4.55
So.Chicago,Ill. W14 ....4.15
SpringCity,Pa.(5) K3 ...4.55
Struthers,O. Y1 .....4.15
Waukegan,Ill. A7 .....4.15
Youngstown F3, Y1 ....4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 .....4.90
Ambridge,Pa. W18 .....4.90
BeaverFalls,Pa. M12 ...4.90
Bethlehem,Pa. B2 .....4.90
Buffalo B5 .....4.90
Canton,O. R2, T7 .....4.90
Carnegie,Pa. C12 .....4.90
Chicago W18 .....4.90
Cleveland A7, C20 .....4.90
Detroit P17 .....5.05
Donora,Pa. A7 .....4.90
Elyria,O. W8 .....4.90
Gary,Ind. R2 .....4.90
Hammond,Ind. L2, M13.4.90
Hartford,Conn. R2 .....5.20
Harvey,Ill. B5 .....4.90
Lackawanna,N.Y. B2 ...4.90
Mansfield,Mass. B5 ....5.20
Massillon,O. R2, R8 ....4.90
Midland,Pa. C18 .....4.90
Monaca,Pa. S17 .....4.90
Newark,N.J. W18 .....5.20
Plymouth,Mich. P5 .....5.10
So.Chicago,Ill. R2, W14.4.90
Struthers,O. Y1 .....4.90
Warren,O. C17 .....4.90
Waukegan,Ill. A7 .....4.90
Worcester,Mass. A7 ....5.20
Youngstown F3, Y1 ....4.90

RAIL STEEL BARS
ChicagoHts.(3,4)C2,I-2 .3.45
Dallas,Tex(4) S20 .....6.00
Franklin,Pa.(3, 4) F5..3.70
FortWorth,Tex.(26) T4..4.33
Huntngtn,W.Va.(3) W7.4.00
Marion,O.(3) P11 .....3.70
Moline,Ill.(3) R2 .....3.55
Williamsport(3) S19 ....3.70

BARS, Wrought Iron
Economy,Pa.(S.R.) B14.8.60
Economy,Pa.(D.R.)B14 11.00
Economy(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 ..12.25
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ..11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ...3.45
Alton,Ill.(6) L1 .....3.45
Atlanta A11 .....3.60
Buffalo R2 .....3.45
Cleveland R2 .....3.45
Emeryville,Calif. J7 ...4.20
Fairfield,Ala. T2 .....3.45
Fontana,Calif. K1 .....4.10
Gary,Ind. C3 .....3.45
Houston,Tex. S5 .....3.85
Ind.Harbor,Ind. I-2, Y1.3.45
Johnstown,Pa. B2 .....3.45
KansasCity,Mo. S5 ....4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 .....4.15
Milton,Pa. B6 .....3.45
Minnequa,Colo. C10 ....4.25
Niles,Calif. P1 .....4.17
Pittsburgh,Calif. C11 ...4.15
Pittsburgh J5 .....3.45
Portland,Oreg. O4 .....4.20
SandSprings,Okla. S5 ..4.35
Seattle B3, N14 .....4.20
So. Chicago,Ill. R2 ....3.45
So.Duquesne,Pa. C3 ....3.45
So.SanFrancisco B3 ....4.20
SparrowsPoint,Md. B2 ..3.45
Struthers,O. Y1 .....3.45
Torrance,Calif. C11 ....4.15
Youngstown C3, R2 ....3.45

BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..4.50
Johnstown, ¼-1" B2 ....4.35
LosAngeles B3 .....5.00
Marion,O. P11 .....4.50
Seattle B3, N14 .....5.10
So.SanFrancisco B3 ....5.00
SparrowsPt., ¼-1" B2 ..4.35
Williamsport,Pa. S19 ..4.35

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ...3.35
Ashland,Ky.(8) A10 ....3.35
Butler,Pa. A10 .....3.35
Cleveland J5, R2 .....3.35
Conshohocken,Pa. A3 ....3.60
Detroit M1 .....4.15
Ecorse,Mich.(8) G5 ....3.55
Fairfield,Ala. T2 .....3.35
Fontana,Calif. K1 .....4.25
Gary,Ind. C3 .....3.35
Geneva,Utah G1 .....3.45
Ind.Harbor,Ind. I-2, Y1.3.35
Irvin,Pa. C3 .....3.35
Lackawanna,N.Y. B2 ...3.35
Munhall,Pa. C3 .....3.35
Pittsburg,Calif. C11 ....4.05
Pittsburgh J5 .....3.35
Sharon,Pa. S3 .....3.50
So.Chicago,Ill. W14 ....3.35
SparrowsPoint,Md. B2 ..3.35
Steubenville,O. W10 ....3.35
Torrance,Calif. C11 ....4.05
Warren,O. R2 .....3.35
Weirton,W.Va. W6 .....3.35
Youngstown C3, Y1 ....3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..4.50
Dover,O. R1 .....4.65
Ind.Harbor,Ind. I-2 ....4.40
Mansfield,O. E6 .....4.15
Niles,O. N12 .....4.10
Torrance,Calif. C11 ....5.15

SHEETS, H-R (14 ga., heavier) High-strength Low-Alloy
Cleveland J5, R2 .....5.05
Conshohocken,Pa. A3 ..5.05
Ecorse,Mich. G5 .....5.25
Fairfield,Ala. T2 .....5.05
Fontana,Calif. K1 .....6.74
Gary,Ind. C3 .....5.05
Ind.Harbor,Ind. I-2, Y1.5.05
Irvin,Pa. C3 .....5.05
Lackawanna(35) B2 ....5.05
Pittsburgh J5 .....5.05
Sharon,Pa. S3 .....5.05
So.Chicago,Ill. C3 ....5.05
SparrowsPoint(36) B2 ..5.05
Warren,O. R2 .....5.05
Weirton,W.Va. W6 .....5.05
Youngstown, C3, Y1 ...5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....6.20
Ecorse,Mich. G5 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. C3 .....6.20
Ind.Harbor,Ind. I-2, Y1.6.20
Irvin,Pa. C3 .....6.20
Lackawanna(37) B2 ....6.20
Pittsburgh J5 .....6.20
SparrowsPoint(38) B2...6.20
Warren,O. R2 .....6.20
Weirton,W.Va. W6 .....6.20
Youngstown Y1 .....6.20

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky. (8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.40
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo, Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin, Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

BLUED STOCK, 29 Ga.

Yorkville,O. W10	6.00

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance, Cal. C11	5.95	...

SHEETS, Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45
Fairfield,Ala. T2	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, Wrought Iron

	An'l	Galv.
Apollo,Pa. B14	12.00	15.50

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance,Calif C11	4.05

SHEETS, ALUMINIZED

Butler,Pa. A10	7.75

SHEETS, Well Casing

Fontana, Calif. K1	4.80

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton,W.Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)	...	...	6.90	8.15	...
Ind.Harbor, Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.20	6.70	...	...
Parkersburg F4 (cut lengths)	...	...	...	...	8.75
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	...
Parkersburg F4 (cut lengths)	9.30	...	...	...
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	...	...	...
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.20	14.70
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary, C3	7.30	7.50
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity, Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	5.70
Sharon,Pa. S3	4.95
So.SanFrancisco(25) B3	5.70
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.10
Carnegie,Pa. S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10) S15	5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.25
Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	3.50
Buffalo(27) R2	3.25
Butler,Pa. A10	3.25
Carnegie,Pa. S18	3.50
Conshohocken,Pa. A3	*3.50*
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	3.50
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.50
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.50
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Fontana,Calif. K1	11.15
Harrison,N.J. C18	9.50
NewBritn.Conn.(10) S15	9.50
Pawtucket,R.I.(11) NS	9.50
Pawtucket,R.I.(12) NS	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.85	8.80	...
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	...
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	...
NewCastle,Pa. E5	4.50	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. NS: Cleve.orPitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.50	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.15	5.95	6.55	8.50	10.80

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	4.50
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	4.75
Detroit M1	4.95
Dover,O.(40) G6	4.50
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.50
Fontana,Calif. K1	5.75
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.85
Mattapan,Mass. T6	5.00
Middletown,O. A10	4.15
NewBritain(10) S15	4.50
NewCastle,Pa. B4	4.50
NewCastle,Pa.(40) E5	4.50
NewHaven,Conn. D2	5.00
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	5.15
Pawtucket,R.I.(21) NS	5.00
Riverdale,Ill. A1	4.30
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.50
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	5.00
Wallingford,Conn. W2	5.00
Warren,O.(40) T5	4.50
Warren,O. R2	4.50
Weirton,W.Va. W6	4.15
Youngstown C8, (40)	4.50
Youngstown Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co
B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B14 A. M. Byers Co.
C1 Calif. Cold Rolled Steel
C2 Calumet Steel Div., Borg-Warner Corp.
C3 Carnegie-Illinois Steel
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve.Cold.Roll.MillsCo.
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Son, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H4 Heppenstall Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K5 Kidd Drawn Steel Co.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

TIGHT COOPERAGE HOOP

Atlanta A11 .....3.40
Riverdale,Ill. A1 .....3.40
Sharon,Pa. S3 .....3.65
Youngstown C3 .....3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....5.90
Alton,Ill.(1) L1 .....5.90
Bartonville,Ill.(1) K4 ..5.90
Buffalo W12 .....5.90
Cleveland A7 .....5.90
Donora,Pa. A7 .....5.90
Duluth A7 .....5.90
Fostoria,O. S1 .....5.90
Johnstown,Pa. B2 .....5.90
LosAngeles B3 .....6.85
Milbury,Mass.(12) N6 .6.20
Monessen,Pa. P7, P16..5.90
Palmer,Mass. W12 .....6.20
Pittsburg,Calif. C11 ...6.85
Portsmouth,O. P12 ....5.90
Roebling,N.J. R5 .....6.20
So.Chicago,Ill. R2 .....5.90
SparrowsPoint,Md. B2..6.00
Struthers,O. Y1 .....5.90
Trenton,N.J. A7 .....6.20
Waukegan,Ill. A7 .....5.90
Williamsport,Pa. B2 ....6.00
Worcester A7,J4,T6,W12.6.20
Worcester,Mass. N6 ....6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....5.35
Buffalo W12 .....5.35
Cleveland A7 .....5.35
Crawfordsville,Ind. MS..5.35
Dover,O. G6 .....5.35
Fostoria,O. S1 .....5.50
Kokomo,Ind. C16 .....5.35
FranklinPark,Ill. T6 ...5.70
Massillon,O. R8 .....5.35
Monessen,Pa. P7, P16..5.35
Pawtucket,R.I.(12) NS..6.00
Trenton,N.J. R5 .....5.65
Worcester A7, T6, W12.5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4 ..8.45
Buffalo W12 .....8.45
Chicago W13 .....8.45
Cleveland A7 .....8.45
Crawfordsville,Ind. MS..8.45
Fostoria,O. S1 .....8.45
Johnstown,Pa. B2 .....8.45
Kokomo,Ind. C16 .....8.45
Monessen,Pa. P16 .....8.45
Palmer,Mass. W12 .....8.75
Portsmouth,O. P12 .....8.45
Roebling,N.J. R5 .....8.75
Waukegan,Ill. A7 .....8.45
Worcester,Mass. A7,T6..8.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4..10.55
Monessen,Pa. P16 ....10.80
Roebling,N.J. R5 .....10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2 ..4.50
Aliquippa,Pa. J5 .....4.50
Atlanta A11 .....4.60
Alton,Ill.(1) L1 .....4.50
Bartonville,Ill.(1) K4 ..4.50
Buffalo W12 .....4.50
Chicago W13 .....4.50
Cleveland A7, C20, R2..4.50
Crawfordsville,Ind. MS..4.60
Donora,Pa. A7 .....4.50
Duluth A7 .....4.50
Fairfield,Ala. T2 .....4.50
Fostoria,O.(24) S1 ....4.85
Houston S5 .....4.90
Johnstown,Pa. B2 .....4.50
Joliet, Ill. A7 .....4.50
KansasCity,Mo. S5 .....5.10
Kokomo,Ind. C16 .....4.60
LosAngeles B3 .....5.45
Minnequa,Colo. C10 ....4.75
Monessen,Pa. P7 .....4.50
Newark, 6-8ga. I-1 .....5.15
No. Tonawanda B11 ...4.50
Palmer, Mass. W12 ...4.80
Pittsburg,Calif. C11 ...5.45
Portsmouth,O. P12 .....4.50
Rankin,Pa. A7 .....4.50
So.Chicago,Ill. R2 .....4.50
So.SanFrancisco C10 ...5.45
SparrowsPoint,Md. B2..4.60
Sterling,Ill.(1) N15 ....4.50
Struthers,O. Y1 .....4.50
Torrance,Calif. C11 ....5.45
Waukegan,Ill. A7 .....4.50
Worcester,Mass. A7 ....4.80
Worcester,Mass. T6 ....4.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....5.55
Alton,Ill.(1) L1 .....5.55
Buffalo W12 .....5.55
Cleveland A7 .....5.55
Donora,Pa. A7 .....5.55
Duluth A7 .....5.55
Johnstown,Pa. B2 .....5.55
LosAngeles B3 .....6.50
Monessen,Pa. P7, P16..5.55
NewHaven,Conn. A7 ...5.85
Palmer,Mass. W12 ....5.85
Pittsburg,Calif. C11 ...6.50
Portsmouth,O. P12 .....5.55
Roebling,N.J. R5 .....5.85
So.Chicago,Ill. R2 .....5.55
SparrowsPoint,Md. B2..5.65
Struthers,O. Y1 .....5.55
Torrance,Calif. C11 ....6.50
Trenton,N.J. A7 .....5.85
Waukegan,Ill. A7 .....5.55
Worcester,Mass. A7 ....5.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 ....8.15
Monessen,Pa. P16 .....8.15
Roebling,N.J. R5 .....8.45
SparrowsPoint,Md. B2 ..8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12.	4.50	...
Cleveland A7 ...	5.35	5.60
Crawfordsvil. MS.	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5.	5.75	6.00
Johnstown B2 ..	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy.Mo. S5.	5.95	6.20
Kokomo C16 ..	5.45	5.70
LosAngeles B3 ..	6.30	...
Minnequa C10 ..	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12.	4.80	...
Pitts.,Cal. C11 ..	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2 ..	5.35	5.60
So.S.Fran. C10 ..	6.30	6.55
SparrowsPt, B2..	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1..	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7 ...	5.65	5.90

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7 ...	9.80	11.30
Crawfrdvil. MS..	9.80	11.30
Fostoria,O. S1 ..	9.90	11.40
Johnstown B2 ..	9.80	11.30
Kokomo C16 ...	9.80	11.30
Minnequa C10 ..	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11 ..	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2..	9.90	11.40
Waukegan A7 ..	9.80	11.30

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	..126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill. K4	126
Crawfordsville MS	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12..	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10..	146
SparrowsPoint,Md. B2...	128
Sterling,Ill.(1) N15	126

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	116
Duluth A7	116
Franklin,Pa. F5	116
Huntington,W.Va. W7	..116
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Marion,O. P11	116
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	...130

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2 ...116
Ala.City,Ala.,17-18ga.R2 198
Aliquippa,Pa.9-14½ga.J5.116
Atlanta A11 118
Bartonville,Ill.(19) K4 ..116
Crawfordsville,Ind. MS ..118
Donora,Pa. A7 116
Duluth A7 116
Houston,Tex. S5 124
Fairfield,Ala. T2 116
Johnstown,Pa. B2 116
Johnstn,17ga.6" B2 190
Johnstn,17ga.,4" B2 193
Joliet,Ill. A7 116
KansasCity,Mo. S5 128
Kokomo,Ind. C16 118
Minnequa,Colo. C10 121
Monessen,Pa. P7 116
Pittsburg,Calif. C11 139
Portsmouth,O.(18) P12 ..116
Rankin,Pa. A7 116
So.Chicago,Ill. R2 116
Sterling,Ill. N15 116

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	...113
Atlanta A11	114
Bartonville,Ill.(19) K4	..113
Chicago W13	113
Crawfordsville MS	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10..	137
SparrowsPoint,Md. B2	..115
Sterling,Ill.(1) N15	113

AXLES

Ind.Harbor,Ind. S13 ....5.25
Johnstown,Pa. B2 .....5.25

JOINT BARS

Bessemer,Pa. C3 .....4.40
Fairfield,Ala. T2 .....4.40
Ind.Harbor,Ind. I-2 ....4.40
Joliet,Ill. C3 .....4.40
Lackawanna,N.Y. B2 ..4.40
Minnequa,Colo. C10 ....4.40
Steelton,Pa. B2 .....4.40

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1..5.60
KansasCity,Mo. S5 .....5.85
Lebanon,Pa. B2 .....5.60
Minnequa,Colo. C10 ...5.60
Pittsburgh J5 .....5.60
Seattle B3 .....6.10
So.Chicago,Ill. R2 .....5.60
Struthers,O. Y1 .....5.60
Youngstown R2 .....5.60

NAILS & STAPLES, Stock

To dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	...106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	..106
Chicago,Ill. W13	106
Cleveland A9	111
Crawfordsville,Ind. MS	..108
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	..108
Sterling,Ill.(1) N15	106
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2 ...5.35
Bartonville,Ill.(19) K4 ..5.35
Crawfordsville,Ind. MS ..5.45
Donora,Pa. A7 .....5.35
Duluth A7 .....5.35
Johnstown,Pa. B2 .....5.35
Joliet,Ill. A7 .....5.35
Kokomo,Ind. C16 .....5.45
Minnequa,Colo. C10 ....5.60
Pittsburg,Calif. C11 ....6.30
Portsmouth,O. P12 .....5.35
Rankin,Pa. A7 .....5.35
So.Chicago,Ill. R2 .....5.35
SparrowsPoint,Md. B2 ..5.45
Worcester,Mass. A7 ....5.65

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa.	A3..$6.75
Wheeling,W.Va.	W10 ...6.75

TIE PLATES

Fairfield,Ala. T2 .....4.20
Gary,Ind. C3 .....4.20
Ind.Harbor,Ind. I-2 ....4.20
Lackawanna,N.Y. B2 ....4.20
Minnequa,Colo. C10 ....4.20
Pittsburg,Calif. C11 ....4.35
Seattle B3 .....4.35
Steelton,Pa. B2 .....4.20
Torrance,Calif. C11 ....4.35
Weirton,W.Va. W6 .....4.20

TRACK BOLTS (20) Treated

KansasCity,Mo. S5 .....9.10
Lebanon,Pa.(32) B2 .....8.85
Minnequa,Colo. C10 ....9.10
Pittsburgh O3, P14 ....9.10
Seattle B3 .....9.35

ROPE WIRE

	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P7, P16	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

RAILS

	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	3.75

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50-31.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, T7, U4, V2, V3

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

(1) Chicago base.
(2) Angles, flats, bands.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) 3" & wider; over ½" to under 3" 5.50c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(24) Deduct 0.35c for finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, to fabricators (¾" bar, elec. furn. billet, 5.03c); to consumers, 5.08c.
(27) Bar mill sizes.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.75c. 0.035" and heavier.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	36.5	34.5	33.5	5.5	3.5	5.5
¼	6.0	0.42	33.5	31.5	30.5	5.5	3.5	6.5
⅜	6.0	0.57	29.0	27.0	26.0	0.5	+1.5	2.5
½	8.5	0.85	40.5	38.5	39.5	21.0	19.0	20.0
¾	11.5	1.13	43.5	41.5	42.5	25.0	23.0	24.0
1	17.0	1.68	46.0	44.0	45.0	28.0	26.0	27.0
1¼	23.0	2.28	46.5	44.5	45.5	28.5	26.5	27.5
1½	27.5	2.73	47.0	45.0	46.0	29.0	27.0	28.0
2	37.0	3.68	47.5	45.5	46.5	29.5	27.5	28.5
2½	58.5	5.82	48.0	46.0	47.0	30.0	28.0	29.0
3	76.5	7.62	48.0	46.0	47.0	30.0	28.0	29.0

Column A: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ¼", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 points lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown; plus 43% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3". Y-1; Alton, Ill. (Lorain, O., base) L1.

Column D: Etna, Pa. N2; Monaca, Pa. quotes 1 pt lower on ½" through 3", P9; Sharon, Pa. M6, quotes 1 pt lower on ⅛", 1 pt higher on ⅜" and 1 pt lower on ½" through 3"; Butler, Pa., ⅛" through ⅜", F6; Benwood, W. Va., W10 except 3½ pts lower on ¼", 2½ pts lower on ¼", 3 pts lower on ⅜" Wheatland, Pa., except 2 pts lower on ⅛", ¼" and ⅜"; W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 24.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 8 pts lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	17.5	36.0	17.5
2½	58.5	5.82	39.0	20.5	39.0	20.5
3	76.5	7.62	39.0	20.5	39.0	20.5
3½	92.0	9.20	41.0	22.5	41.0	22.5
4	$1.09	10.89	41.0	22.5	41.0	22.5
5	1.48	14.81	41.0	22.5	41.0	22.5
6	1.92	19.18	41.0	22.5	41.0	22.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, N3; Youngstown, Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2¼	12	25.29	29.76	24.53	28.87
2½	12	27.71	32.58	26.88	31.60
2¾	12	29.36	34.53	28.48	33.49
3	12	30.82	36.27	29.90	35.18
3¼	11	35.87	42.22	34.79	40.95
3½	11	38.52	45.35	37.36	43.99
4	10	47.82	56.25	46.39	54.56
4½	9	63.37	74.59	61.47	72.35
5	9	73.37	86.32	71.17	83.73
6	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Strip: Cold-Rolled Carbon Base 10% Both Sides	Sheets: Carbon Base 10%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	....	....	19.75	21.50–24.00	75.00
304	22.50	26.50	....	20.75	22.50–25.5	77.00
305	....	....	....	....	....	79.00
309	28.00	32.00	....	....	....	....
310	34.00	38.00	....	....	....	105.00
316	27.00	31.00	....	26.00	28.00–33.5	....
317	32.00	36.00	....	....	....	....
318	31.00	35.00	....	....	....	....
321	24.00	28.00	....	23.00	25.00	90.00
347	25.00	29.00	....	24.00	26.00–31.5	94.00
405	18.75	24.75	....	....	....	....
410	18.25	24.25	....	....	....	....
430	18.25	24.25	....	....	....	....
Nickel	31.00	41.00	31.50 41.00	....	....	88.00
Inconel	39.00	51.00	....	....	....	140.00
Monel	32.00	42.00	26.50 33.50	....	....	83.00
Copper*	....	....	20.70† 25.65‡	....	....	....

* Deoxidized. † 17.20c for hot-rolled. ‡ 22.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16; stainless-clad plates, Coatesville, Pa. L7 quotes 1 cent higher on 10% and 1½ cents higher on 20%; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	27
⅝-in. & ⅞-in.	29
1-in. and larger	26
Longer than 6 in.: All diams.	22
Lag bolts, all diams.: 6 in. and shorter	30
over 6 in. long	28
Ribbed Necked Carriage	26
Blank	40
Plow	40
Step, Elevator, Tap, and Sleigh Shoe	28
Tire bolts	20
Boiler & Fitting-Up bolts	37

NUTS

H.P. & C.P. Reg. & Heavy Square:	
½-in. and smaller	25
⅝-in. & ⅞-in.	23
1-in.-1½-in.	23
1⅝ in. and larger	16

H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ⅞-in.	28	25
1-in.-1½-in.	25	23
1⅝ in. & larger	17	16

C.P. Hex:		
½-in. & smaller	33	29
⅝-in. & ⅞-in.	30	27
1-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Hvy.	Reg.	Lght.
½-in. and smaller	35	41	41
⅝-in. & ⅞-in.	30	36	36
1-in.-1½-in.	27	31	33
1⅝-in.&larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish ..... 63.5 & 10

Plated finishes ... 50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

¼-in. through ⅝-in.	50
¾-in. through 1 in.	43
Longer than 6 in.: ¼-in. through ⅝-in.	33
¾-in. through 1 in.	13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	46
1 in. and smaller diam. x over 6 in.	33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	41
¼-in. diam. & larger	24
N.F. thread, all diams.	18

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.25c

7/16-in., under .....43 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers .....List to 50c off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5⅛	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	39.00	32.00	30.00
302	39.00	34.50	30.00
303	41.00	38.00	32.50
304	41.00	36.50	31.50
309	53.50	52.50	43.00
316	54.50	56.50	47.50
321	47.00	46.00	35.50
347	51.50	50.00	40.00
410	34.50	28.50	24.50
416	35.00	35.00	25.00
420	42.00	45.00	30.00
430	37.00	29.00	25.00
501	25.50	24.00	13.00
502	26.50	25.00	14.00

Baltimore, Types 301 through 347 sheet, except 309 E2.

Baltimore, bars, wire and structurals A10.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., strip except Type 416, S18.

Cleveland, strip A7.

Detroit, strip, except Types 303, 309, 321, 416, 420, 501 and 502 M1.

Dunkirk,N.Y., bars, wire A4.

Duquesne, Pa., bars C3.

Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.

Gary, Ind., sheets except Type 416 C3.

Harrison, N. J., strip C18.

Harrison, N. J., Types 302, 304, 316 wire and strip D6.

Massillon, all products R2.

McKeesport, Pa., bars; sheets except Type 416 C3.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars C3.

Pittsburgh, sheets C18.

Reading, Pa., bars & strip C4.

So. Chicago, Ill., bars & structurals C3.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars except Type 309 43.50c, type 316 48.50c U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 59.50c, strip 61.50c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 25.00

Toluol, one deg...18.25-25.75

Industrial xylol ..19.75-27.50

Per ton bulk, ovens

Sulphate of ammonia .$32-45

Cents per pound, ovens

Phenol, 40 (carlots, returnable drums) 13.50

Do., less than carlots. .14.25

Do., tank cars 12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $39; less than 60%, $36.

Imported, net ton, duty paid, metallurgical grade, $39-40.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge Iron:	Cents
98+% Fe, carlots	15.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe minus 325 mesh	48.50
Powder Flakes	44.50
Carbonyl Iron:	
94.9-99.8%, size 5 to 10 microns	.70.00-135.00
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots	.28.50-31.25
Copper:	
Electrolytic	31.75
Reduced	31.50
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed	75.50
Nickel-Silver, 10-ton lots	41.75
Silicon	34.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302	75.00
Tin	91.12
Zinc, 10-ton lots	.20.50-28.00
Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed:	
over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb	3.00
98.8% minus 65 mesh, freight allowed:	
1000 lb and over	2.90
less than 1000 lb	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb	2.75
82-85%, freight allowed 2000 lb and over	2.40
less than 2000 lb	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll,fur.	$14.00-14.50
Connellsvll,fdry.	15.00-16.00
New River, foundry	19.00
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.00
Everett, Mass., ovens	
New England, del.	23.40
Chicago, ovens	21.00
Chicago del.	22.45
Detroit, del.	24.91
Terre Haute, ovens	21.20
Milwaukee, ovens	21.75
Indianapolis, ovens	20.75
Chicago, del.	24.12
Cincinnati, del.	23.67
Detroit, del.	24.65
Ironton, O., ovens	20.40
Cincinnati, del.	22.71
Painesville, O., ovens	21.90
Buffalo, del.	24.02
Cleveland, del.	23.62
Erie, del.	22.04
Birmingham, ovens	19.15
Birmingham, del.	20.20
Philadelphia, ovens	21.25
Neville Island,Pa.,ovens	21.00
Swedeland, Pa., ovens	21.20
St. Louis, ovens	22.99
St. Louis, del.	24.12
Portsmouth, O., ovens	20.15
Cincinnati, del.	22.71
Detroit, ovens	21.65
Detroit, del.	22.65
Buffalo, del.	24.69
Flint, del.	24.09
Pontiac, del.	23.04
Saginaw, del.	24.40

Includes representative switching charge of: *, $1.00; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York(city)	5.82	6.84	7.73	6.14	...	5.97	6.64	8.60	5.95	6.18	7.64
New York(c'try)	5.52	6.64	7.53	5.84	...	5.67	6.44	8.40	5.65	5.88	7.34
Boston (city)	5.95	6.75	7.37	5.90	...	5.80	6.39	8.70	5.95	6.28	7.48
Boston (c'try)	5.75	6.55	7.17	5.70	...	5.60	6.19	8.50	5.75	6.08	7.28
Phila. (city)	6.60-6.70	6.75	7.10	5.90	...	5.85	6.46	8.40	5.70	5.90	7.00
Phila. (c'try)	6.35-6.45	6.50	6.85	5.65	...	5.60	6.21	8.15	5.45	5.65	6.75
Balt. (city)	5.35	6.59	6.66	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try)	5.15	6.39	6.46	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va.	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va.	5.35	...	6.90	5.63	...	5.53	6.30	...	5.63	5.45	7.13
Wash. (w'hse)	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††§	5.55	5.85	7.15
Buffalo (w'hse)	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††§	5.35	5.65	6.95
Pitts. (w'hse)	5.15	5.95*	6.60-6.70	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse)	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††§	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.30	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse)	5.15	5.95	7.10	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city)	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city)	5.35	6.15	7.05	5.30	...	5.30	5.85	9.75††§	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.85	5.10	...	5.10	5.65	9.55††§	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	6.94	5.44	...	5.44	6.09	9.89††§	5.59	5.74	6.94
Milwau. (c'try)	5.29	6.09	7.14	5.24	...	5.24	5.89	9.69††§	5.39	5.54	6.74
St. Louis (del.)	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††§	5.78	5.93	7.13
St. L. (w'hse)	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††§	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[2]	5.25	...	5.25	6.88	...	5.40	5.55	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[2]	5.10	...	5.10	...	...	5.25	5.40	...
Los Ang. (city)	6.10	7.65	8.20	6.15	8.90	6.10	7.75	...	6.10	6.20	8.40
L. A. (w'hse)	5.90	7.45	8.00	5.95	8.70	5.90	7.55	...	5.90	6.00	8.20
San Francisco	6.50[9]	7.60[3]	7.50[2]	7.45[9]	8.25[3]	6.30[9]	7.55	...	6.30[9]	6.40[9]	8.50[9]
Seattle-Tacoma	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [5]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $106. Hard-fired, $142 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; bulk, $33; single paper bags, $38.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Bonne Terre, Mo.; Blue Bell, Williams, Millville, W. Va., Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Mo., $12.45; Martin, Millersville, Narlo, Clay Center, and Bettsville, O., Billmeyer, Plymouth Meeting, Pa., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Chinese	$29.00-$29.50
Brazilian	29.00-29.50
Bolivian	29.00-29.50
Domestic scheelite, del.	$28.50

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.5c-81.5c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00
South African Transvaal	
44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50
Brazilian	
44% 2.5:1 lump	$32.00
Rhodesian	
45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb. molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces, $172. Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices. 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c; less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 131)

Metal Shortages Become Acute

Fabricators reduce operations to conserve dwindling supplies. Some copper producers raise prices, making range for electrolytic 22.50c to 24.50c, delivered

New York—Warning by C. Donald Dallas, chairman, Revere Copper & Brass Inc., this city, that "confused if not chaotic conditions threaten in the copper industry" is substantiated by subsequent developments. The "almost explosive forces threatening to propel prices upwards" began to take effect last week.

On Aug. 21 Calumet & Hecla Consolidated Copper Co. increased its price for lake copper 2 cents a pound to the basis of 24.62½c, delivered to plants of domestic customers. The increase was necessary to meet advancing costs, the company said. Other sellers of lake copper are in a completely sold-out position.

American Smelting & Refining Co. also advanced its price for electrolytic copper 2 cents a pound to the basis of 24.50c, delivered Connecticut Valley. None of the other custom smelters nor the leading mine producers have taken similar action, making the quotable range on the market 22.50c to 24.50c.

Duty Passed to Users—On the same date, American Brass Co. and Anaconda Wire & Cable Co. placed into effect a new pricing policy under which customers will be charged the 2-cent import duty on whatever proportion of foreign copper is used in processing their orders. Similar action has been taken by Scovill Mfg. Co. and is under consideration by other leading fabricators.

Mr. Dallas says it is entirely reasonable to believe that total United States demand for copper in the next 12 months will reach the "astronomical" figure of 2 million tons. As against this effective demand, domestic production of primary copper from the mines, plus recovery of secondary metal, is running at the rate of only 1 million tons a year. "In short," he continues, "domestic production is only 50 per cent of domestic demand, including government programs . . . Consistently large production by domestic producers at high prices stems from the fact that demand for the metal in the United States has been such that every year for 10 years the country has been a large net importer of copper. It will continue to be so unless the ill-advised efforts of the tariff advocates succeed in throttling the industries using copper."

Due to the shortage of metal, most fabricators have reduced their work week from six to five days. This comes at a time when customers of the brass mills, wire mills and foundries are placing the largest volume of business in peacetime history. Orders booked during July for future shipment by these makers of copper and copper-alloy products called for the use of 190,967 tons of refined copper. This represents an increase of 63,328 tons over the June total. Because of the heavy inflow of new business, unfilled orders on the books of copper product manufacturers at the end of July totaled 305,430 tons, an increase of 93,030 tons. The deficit in the fabricators' sales position rose to 144,966 tons at the end of July from 85,966 tons at the end of June and compared with 149,424 tons at the end of January, 1949, the next previous high.

Prices advanced last week in the red metal scrap and brass and bronze ingot markets.

Remelt Aluminum Prices Up

New York—As a result of a sharp advance in aluminum scrap prices, leading smelters of secondary aluminum ingot raised their prices around 2½ cents a pound. Smelters claim that conversion deals are draining the available supplies out of normal channels with prices ranging from 15.25c for the lowest grade scrap to 17.50c or higher for the better grades.

Lead Advances One Cent

New York—Advance of 1-cent a pound in the price of lead to the basis of 13.80c St. Louis, failed to dampen consumers' buying interest. Demand is still far in excess of supplies and is being received from all classifications of consumers. It is particularly heavy, however, from battery manufacturers. Some users are paying premiums over the domestic market price for foreign metal. Lead imports totaled 202,126 tons in the first half of this year against 140,095 tons in the like 1949 period.

Manufacturers of lead products, oxides and pigments increased their prices in line with the higher primary lead market, effective Aug. 21.

Tin Market Lacks Stability

New York—Tin prices continue to fluctuate widely, Straits spot rising from $1.02 a pound on Aug. 18 to $1.07 ¾ on Aug. 21, and easing to $1.04 by Aug. 24. Actual sales are light due to reluctance of consumers to pay close to all-time highs, as well as to the actual scarcity of refined tin.

Zinc Market Remains Firm

New York—Despite an acute shortage of zinc, prices are unchanged on the basis of 15.00c, East St. Louis, for prime western. Large premiums are being paid, however, on gray market and on the Commodity Exchange. The stringency in supplies is forcing some consumers to curtail operations.

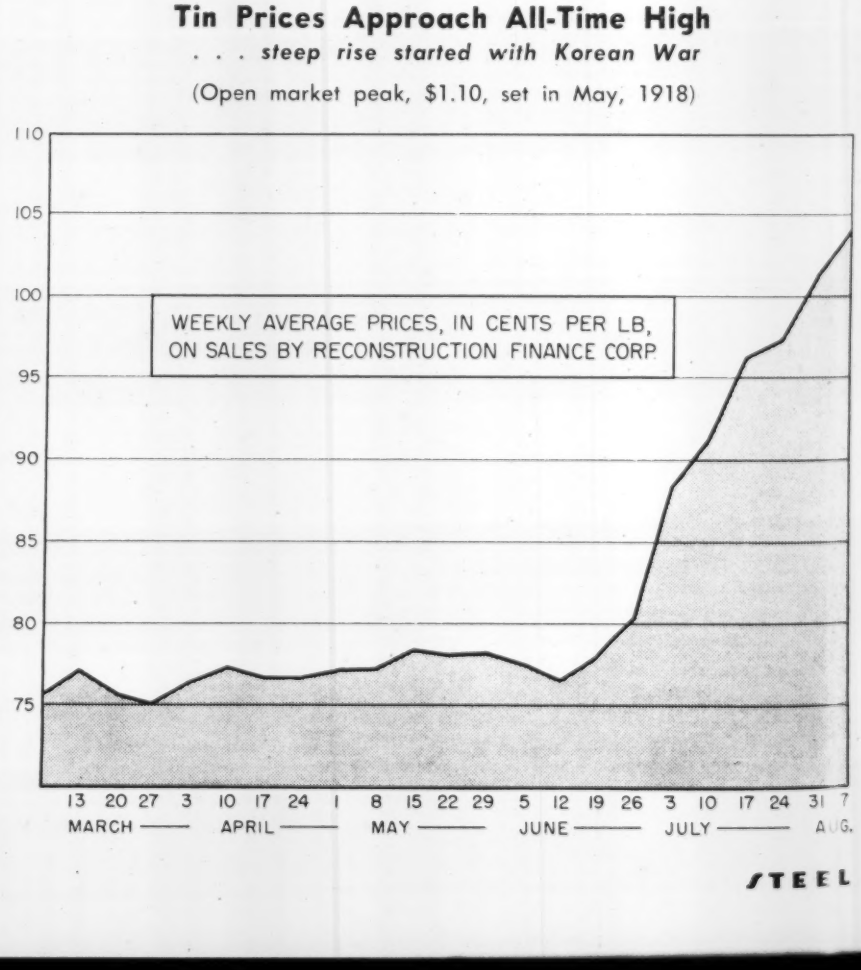
Freight Rate Cut Proposed

Boston—Commodity rate of 39.00c on brass, copper and bronze rods from Ansonia, Conn., to Pownal, Vt. is proposed by railroads to replace current rate of 54.00c; coils one-quarter inch or larger in minimum shipments of 30,000 pounds are affected.

Tin Prices Approach All-Time High

. . . steep rise started with Korean War

(Open market peak, $1.10, set in May, 1918)



NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 22.50-24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingot: 85-5-5-5 (No. 115) 25.50c; 88-10-2 (No. 215) 35.00c; 80-10-10 (No. 305) 29.50c; No. 1 yellow (No. 405) 21.75c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.10c, delivered.

Lead: Common 13.80c; chemical 13.90c; corroding 13.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.50c, pigs 16.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 24.50-24.75c; No. 12 foundry alloy (No. 2 grade) 24.00c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 25.00c; grade 2 24.00-24.50c; grade 3, 23.25-23.50; grade 4, 23.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 22.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt $1.04.

Antimony: American 99-99.8% and over but not meeting specifications below 24.50c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 25.00c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%; Chinese 22.00c; English, 23.00c; Belgian, 23.00c, duty paid, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $77-$80 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $30.00 per lb contained Be, f.o.b., Cleveland and Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.15 del.; special or patented shapes, $2.30.

Cobalt: 97-99%, $1.80 per lb for 500 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $74-$77 per ounce.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 22.50-cent copper.)

Sheet: Copper 37.43; yellow brass 34.19; commercial bronze, 95%, 37.38; 90%, 36.93; red brass, 85% 35.96; 80%, 35.52; best quality, 35.04; nickel silver, 18%, 48.39; phosphor-bronze, grade A, 5% 55.11.

Rods: Copper, hot-rolled 33.28; cold-drawn 34.53; yellow brass free cutting, 28.54; commercial bronze, 95% 37.07; 90% 36.62; red brass 85% 35.65; 80% 35.21.

Seamless Tubing: Copper 37.47; yellow brass 37.20; commercial bronze 90% 39.59; red brass 85% 38.87; 80% 38.43.

Wire: Yellow brass 34.48; commercial bronze, 95% 37.67; 90% 37.22; red brass, 85% 36.25; 80% 35.81; best quality brass 35.33.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 26.67, l.c.l. 27.17, 100,000 lb lots 26.545; weatherproof, f.o.b. eastern mills, c.l. 28.10, l.c.l. 28.60, 100,000 lb lots 27.85; magnet, del., 15,000 lb or more 32.50, l.c.l. 33.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	27.4	...	...
0.135-0.096	12-48	27.9	...	...
0.095-0.077	12-48	28.4	26.5	30.1
0.076-0.061	12-48	29.0	26.7	30.3
0.060-0.048	12-48	29.2	26.9	30.6
0.047-0.038	12-48	29.6	27.1	30.9
0.037-0.030	12-48	30.0	27.5	31.4
0.029-0.024	12-48	30.4	27.8	31.8
0.023-0.019	12-36	31.0	28.2	32.3
0.018-0.017	12-36	31.6	28.8	33.1
0.016-0.015	12-36	32.3	29.4	34.0
0.014	12-24	33.2	30.2	35.1
0.013-0.012	12-24	34.1	30.9	36.0
0.011	12-24	35.1	31.8	37.2
0.010-0.0095	12-24	36.1	32.8	38.5
0.009-0.0085	12-24	37.3	33.9	40.0
0.008-0.0075	12-24	38.6	35.1	41.6
0.007	12-18	40.0	36.4	43.4
0.006	12-18	41.5	37.7	47.5

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.5	....	....
0.156-0.203	41.5	....	....
0.219-0.313	38.5	....	....
0.344	37.5	....	47.5
0.375	37.0	46.0	44.5
0.406	37.0	....	....
0.438	37.0	46.0	44.5
0.469	37.0	....	....
0.500	37.0	46.0	44.5
0.531	37.0	....	....
0.563	37.0	....	42.0
0.594	37.0	....	....
0.625	37.0	43.5	42.0
0.656	37.0	....	....
0.688	37.0	....	42.0
0.750-1.000	36.0	41.0	39.5
1.063	36.0	....	38.0
1.125-1.500	35.0	39.5	38.0
1.563	35.0	....	37.0
1.625	34.0	....	37.0
1.688-2.000	34.0	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $19.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $19.00 per cwt. Traps and bends: List prices plus 55%.

ZINC

Sheets, 20.75c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.00c; over 12-in., 20.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 75.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip, cold-rolled 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-59.00c; 25 to 99 lb. 45.00-49.00c; 100 lb to 5000 lb, 38.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 34.09c; oval 33.59c; cast 32.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 51.40c, under 1000 lb 49.40c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 28.00c; over 200 lb, 27.00c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 65.00c; 10,000 to 30,000 lb, 63.00c; 3000 to 10,000 lb, 67.00c; 500 to 3000 lb, 68.00c; 100 to 500 lb, 70.00c; under 100 lb, 73.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 29.50c; 400-lb bbl. 27.50c up to 10,000 lb, 27.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 44.6c, 10 or more drums 42.6c, f.o.b. Niagara Falls, N. Y.; 45.85c and 43.85c, respectively, del. Cleveland or Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Heavy Clean	Ends Rod	Turnings Clean
Copper	21.50	21.50	20.75
Yellow Brass	18.125	17.875	16.75
Commercial Bronze			
95%	20.375	20.125	19.625
90%	20.125	19.875	19.375
Red brass			
85%	19.875	19.625	19.125
80%	19.50	19.25	18.75
Muntz metal	16.875	16.625	16.125
Nickel, silver, 10%	20.50	20.25	19.25
Phos. bronze, A	21.625	21.375	19.81¼

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; composition red brass 18.25-18.50; radiators 14.75-15.00; heavy yellow brass 14.00-14.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.75; No. 2 copper 20.75; light copper 19.75; refinery brass (60% copper) per dry copper content 20.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 19.75-20.00; No. 2 18.50-18.75; light copper 17.50-17.75; No. 1 composition red brass 16.25-16.50; No. 1 composition turnings 15.75-16.25; mixed brass turnings 10.25-10.50; new brass clippings 17.12½-17.37½; No. 1 brass rod turnings 15.25-15.50; light brass 10.00-10.25; heavy yellow brass 11.25-11.50; new brass rod ends 15.50-15.75; auto radiators, unsweated 12.50-12.75; cocks and faucets, 14.50-14.75; brass pipe 15.50-15.75.

Lead: Heavy 11.50-11.75; battery plates 6.75-7.00; linotype and stereotype 13.00-13.25; electrotype 11.25-11.50; mixed babbitt 10.75-11.00.

Zinc: Old zinc 8.50-8.75; new die cast scrap 8.25-8.50; old die cast scrap 5.50-5.75.

Tin: No. 1 pewter 55.00-57.00; block tin pipe 75.00-77.00; No. 1 babbitt 50.00-52.00.

Aluminum: Clippings 2S 13.00; old sheets 10.00; crankcase 10.00; borings and turnings 6.50.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Aug. 24	22.50-24.50	13.80	15.00	104.00	17.50	24.50	48.00	72.75
Aug. 23	22.50-24.50	13.80	15.00	103.00	17.50	24.50	48.00	72.75
Aug. 22	22.50-24.50	13.80	15.00	106.00	17.50	24.50	48.00	72.75
Aug. 21	22.50-24.50	13.80	15.00	107.75	17.50	24.50	48.00	72.75
Aug. 18-19	22.50	12.80	15.00	102.00	17.50	24.50	48.00	72.75
Aug. 17	22.50	12.80	15.00	101.00	17.50	24.50	48.00	72.75
Aug. 16	22.50	12.80	15.00	105.00	17.50	24.50	48.00	72.75
Aug. 15	22.50	12.80	15.00	107.50	17.50	24.50	48.00	72.75
Aug. 14	22.50	11.80	15.00	106.00	17.50	24.50	48.00	72.75
Aug. 11-12	22.50	11.80	15.00	105.00	17.50	24.50	48.00	72.75
Aug. 10	22.50	11.80	15.00	103.00	17.50	24.50	48.00	72.75
Aug. 9	22.50	11.80	15.00	101.50	17.50	24.50	48.00	72.75
Aug. 8	22.50	11.80	15.00	99.25	17.50	24.50	48.00	72.75
Aug. 4-7	22.50	11.80	15.00	98.50	17.50	24.50	48.00	72.75
Aug. 3	22.50	11.80	15.00	97.75	17.50	24.50	48.00	72.75
Aug. 2	22.50	11.80	15.00	98.00	17.50	24.50	48.00	72.75
Aug. 1	22.50	11.80	15.00	97.50	17.50	24.50	48.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, Aug. 24, 1950; gross tons
Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Aug. 24	$42.50
Aug. 17	40.67
July 1950	37.04
Aug. 1949	20.86
Aug. 1945	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	$46.00‡
No. 2 Heavy Melt.	38.00
No. 1 Busheling	46.00‡
No. 1 Bundles	46.00‡
No. 1 Bundles (low phos)	47.50-48.00
No. 2 Bundles	*38.00-39.00*
Heavy Turnings	*43.00-44.00*
Machine Shop Turnings	*34.00-35.00†*
Mixed Borings, Turnings	*34.00-35.00†*
Short Shovel Turnings	*36.50-37.00*
Cast Iron Borings	*36.00-36.50*
Low Phos. Steel	50.00-51.00

Cast Iron Grades

No. 1 Cupola Cast	44.00-45.00
No. 1 Machinery Cast	*50.00-51.00*
Charging Box Cast	43.00-44.00
Heavy Breakable Cast.	41.00-42.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*47.50-48.50*
Rails, Random Lengths	*48.50-49.00*
Rails, 2 ft. and under	*52.00-52.50*
Rails, 18 in. and under	*52.50-53.00*
Railroad Specialties	*52.00-52.50*

† Crushers' buying prices.
‡ Brokers paying $46-$47.

CLEVELAND

No. 1 Heavy Melt. Steel	$43.00-43.50
No. 2 Heavy Melt. Steel	38.50-39.00
No. 1 Busheling	43.00-43.50
No. 1 Bundles	43.00-43.50
No. 2 Bundles	31.00-32.00
Machine Shop Turnings	29.50-30.00
Mixed Borings, Turnings	33.00-33.50
Short Shovel Turnings.	33.00-33.50
Cast Iron Borings	33.00-33.50
Low Phos.	44.00-44.50

Cast Iron Grades

No. 1 Cupola	49.00-50.00
Charging Box Cast	44.00-45.00
Stove Plate	43.00-44.00
Heavy Breakable Cast.	41.00-42.00
Unstripped Motor Blocks	35.00-36.00
Brake Shoes	39.00-40.00
Clean Auto Cast	*50.00-51.00*
No. 1 Wheels	44.00-45.00
Burnt Cast	39.00-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-46.50
R.R. Malleable	49.00-50.00
Rails, 3 ft and under	53.00-54.00
Rails, 18 in. and under	*55.00-56.00*
Rails, Random Lengths	*50.00-51.00*
Cast Steel	*48.00-49.00*
Railroad Specialties	*49.00-50.00*
Uncut Tires	*50.00-51.00*
Angles, Splice Bars	*51.00-51.50*

VALLEY

No. 1 Heavy Melt. Steel	$46.00-46.50
No. 2 Heavy Melt. Steel	39.50-40.00
No. 1 Bundles	46.00-46.50
Facty. Prod. Bundles.	47.00-47.50
No. 2 Bundles	34.00-34.50
Machine Shop Turnings.	34.00-34.50
Short Shovel Turnings.	36.00-36.50
Cast Iron Borings	36.00-36.50
Low Phos.	46.50-47.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	47.00-47.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$41.00-42.00*
No. 2 Heavy Melt. Steel	*36.00*
No. 1 Busheling	*37.00*
No. 1 Bundles	*41.00-42.00*
No. 2 Bundles	*31.00-32.00*
Machine Shop Turnings	*30.00*
Short Shovel Turnings.	32.00
Mixed Borings, Turnings	28.00-28.50
Low Phos. Punchings and Plate, elec. fur. grade	*45.00*
Low Phos. Plate, 5 ft & Under	*44.00*
Elec. Furnace Bundles	*42.00-43.00*
Heavy Turnings	*38.00*
No. 1 Chemical Borings	*39.00*
Knuckles and couplers	*45.00*
Steel car wheels	*45.00*

Cast Iron Grades

No. 1 Cupola Cast	38.50-39.00
No. 1 Machinery Cast	*43.00*
No. 1 Yard Cast	37.00-37.50
Charging Box Cast	*38.00-39.00*
Heavy Breakable Cast	*38.00-39.00*
Clean Auto Cast	*43.00*
No. 1 Wheels	*46.00-47.00*
Malleable	50.00

CINCINNATI

No. 1 Heavy Melt. Steel	*$43.00*
No. 2 Heavy Melt. Steel	*37.00*
No. 1 Busheling	*43.00*
No. 1 Bundles	*43.00*
No. 2 Black Bundles	*37.00*
No. 3 Bundles	*28.00*
Machine Shop Turnings	*25.00*
Short Shovel Turnings	*28.00*
Mixed Borings, Turnings	*27.00*
Cast Iron Borings	*28.00*

Cast Iron Grades

No. 1 Cupola Cast	*51.00*
Charging Box Cast	*42.00*
Stove Plate	*35.00*
Heavy Breakable Cast	*42.00*
Unstripped Motor Blocks	*32.00*
Brake Shoes	30.00
Clean Auto Cast	*51.00*
Drop Broken Cast	*53.00*
Low Phos. 18 in. and under	*52.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*45.00*
R.R. Malleable	*46.00*
Rails, Rerolling	*48.00*
Rails, Random Lengths	*47.00*
Rails, 18 in. and under	*55.00*

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$30.00-31.00*
No. 1 Bundles	*40.00-41.00*
No. 2 Bundles	*29.00-30.00*
No. 1 Busheling	*38.00-39.00*
Machine Shop Turnings	*25.00-26.00*
Forge Flashings	*37.00-38.00*
Short Shovel Turnings	*29.00-30.00*
Cast Iron Borings	*29.00-30.00*
Punchings & Plate Scrap	*40.00-41.00*

Cast Iron Grades

No. 1 Cupola Cast	*42.00-43.00*
Heavy Breakable Cast	*35.00-36.00*
Clean Auto Cast	*45.00-46.00*

BUFFALO

No. 1 Heavy Melt. Steel	$39.50-40.00
No. 2 Heavy Melt. Steel	36.00-36.50
No. 1 Busheling	36.00-36.50
No. 1 Bundles	37.00-37.50
No. 2 Bundles	34.00-34.50
Machine Shop Turnings	30.00-30.50
Mixed Borings, Turnings	30.00-30.50
Cast Iron Borings	30.00-30.50
Short Shovelings	32.00-32.50
Low Phos.	41.50-42.00

Cast Iron Grades

No. 1 Cupola	*38.50-39.00*
No. 1 Machinery	41.00-42.00
Malleable	36.00-37.00

Railroad Scrap

Rails, 2 ft. and under.	49.00-50.00
Rails, random size	44.00-45.00
Railroad Specialties	42.00-43.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$35.00-36.00*
No. 2 Heavy Melt. Steel	*28.00-29.00*
No. 1 Busheling	*29.00-30.00*
No. 1 Bundles	*35.00-36.00*
No. 2 Bundles	*27.00-28.00*
Machine Shop Turnings	*23.00-24.00*
Mixed Borings, Turnings	22.00-23.00
Short Shovel Turnings	*25.00*
Punchings & Plate Scrap	*36.00-37.00*
Low Phos. Plate, 5 ft & under	*36.00-37.00*
Elec. Furnace Bundles	35.00-36.00

Cast Iron Grades

No. 1 Cupola Cast	*30.00-31.00*
No. 1 Machinery	*32.00*
Charging Box Cast	*30.00-31.00*
Heavy Breakable	*30.00-31.00*
Unstripped Motor Blocks	21.00-22.00

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$33.50-34.00*
No. 2 Heavy Melt. Steel	25.50-26.50
No. 1 Bundles	33.00-34.00
Machine Shop Turnings	*23.00-23.50*
Short Shovel Turnings	*25.00-25.50*
Mixed Borings, Turnings	24.00-24.50
No. 1 Busheling	*32.50-33.00*
Bar Crops and Plate	36.00-37.00
Punchings & Plate Scrap	36.00-37.00
Chemical Borings	*27.50-28.00*

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Mixed Cast	*31.00-32.00*
Heavy Breakable Cast.	28.50-29.00
Stove Plate	29.00-30.00

CHICAGO

No. 1 Heavy Melt. Steel	*$39.50-40.50†*
No. 2 Heavy Melt. Steel	*37.50-38.50†*
No. 1 Bundles	*39.50-40.50†*
No. 2 Bundles	*32.00-33.00†*
Machine Shop Turnings	*28.00-29.00*
Mixed Borings, Turnings	*28.00-29.00*
Short Shovel Turnings.	29.00-30.00
Cast Iron Borings	29.00-30.00
Low Phos.	*48.00-49.00*
Elec. Furnace Bundles	*40.00-41.00*
Heavy Turnings	*33.00-34.00*
Cut Structurals	44.00-45.00

Cast Iron Grades

No. 1 Cupola Cast	*49.00-50.00*
Clean Auto Cast	49.50-50.50
No. 1 Wheels	*41.00-42.00*
Stove Plate	38.00-39.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	44.00-45.00
Malleable	53.00-54.00
Rails, Rerolling	56.00-57.00
Rails, Random Lengths	*50.00-51.00*
Rails, 2 ft and under	*56.00-57.00*
Rails, 18 in. and under	*57.00-58.00*
Railroad Specialties	*49.00-50.00*
Angles, Splice Bars	*53.00-54.00*

† Brokers' buying prices.

BIRMINGHAM

No. 1 Heavy Melt. Steel	*$33.00-34.00*
No. 2 Heavy Melt. Steel	*29.00-30.00*
No. 1 Busheling	29.00-30.00
No. 2 Bundles	*27.00-28.00*
Machine Shop Turnings	*27.00-28.00*
Mixed Borings, Turnings	23.00-24.00
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	27.00-28.00
Bar Crops and Plate	*41.00-42.00*
Cut Structurals	*41.00-42.00*

Cast Iron Grades

No. 1 Cupola Cast	*43.00-44.00*
Stove Plate	*37.00-38.00*
No. 1 Wheels	*37.00-38.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*37.50-38.00*
R.R. Malleable	nominal
Rails, Rerolling	*48.00-49.00*
Rails, 3 ft and under	*48.00-49.00*
Angles and Splice Bars	*47.00-48.00*

ST. LOUIS

No. 1 Heavy Melt. Steel	$38.00-39.00
No. 2 Heavy Melt. Steel	33.00-34.00
No. 1 Bundles	36.00-38.00
No. 2 Bundles	*33.00-34.00*
Machine Shop Turnings	26.00-27.00
Short Shovel Turnings.	27.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Charging Box Cast	36.00-37.00
Heavy Breakable Cast	*38.00-40.00*
Brake Shoes	*42.00-43.00*
Clean Auto Cast	40.00-42.00
Burnt Cast	*36.00-37.00*

Railroad Scrap

R.R. Malleable	45.00-46.00
Rails, Rerolling	*51.00-53.00*
Rails, Random Lengths	*44.00-46.00*
Rails, 2 ft and under	*48.00-50.00*
Uncut Tires	42.00-43.00
Angles, Splice Bars	45.00-46.00
Railroad Specialties	44.00-45.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Bundles	18.00
No. 2 Bundles	17.00
No. 3 Bundles	15.00
Machine Shop Turnings	9.00

Cast Iron Grades

No. 1 Cupola Cast	32.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Rails, Random Lengths	22.00

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	21.50
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	18.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.00
Punchings & Plate Scrap	30.00-32.50
Cut Structurals	30.00-32.50

Cast Iron Grades

No. 1 Cupola Cast	30.00-35.00
Heavy Breakable Cast.	30.00
Stove Plate	25.00-27.50
Unstripped Motor Blocks	30.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	35.00
No. 1 Wheels	32.50

Railroad Scrap

No. 1 R.R. Heavy Melt	25.00
Railroad Malleable	30.00
Rails, Random Lengths	26.00
Angles and Splice Bars.	25.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$23.50
No. 2 Heavy Melt. Steel	21.50
Nos. 1 & 2 Bundles	17.50
No. 3 Bundles	14.50
Machine Shop Turnings	11.00
Mixed Borings, Turnings	8.00
Punchings & Plate Scrap	32.00

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	23.50
Rails, Rerolling	39.50

HAMILTON, ONT.

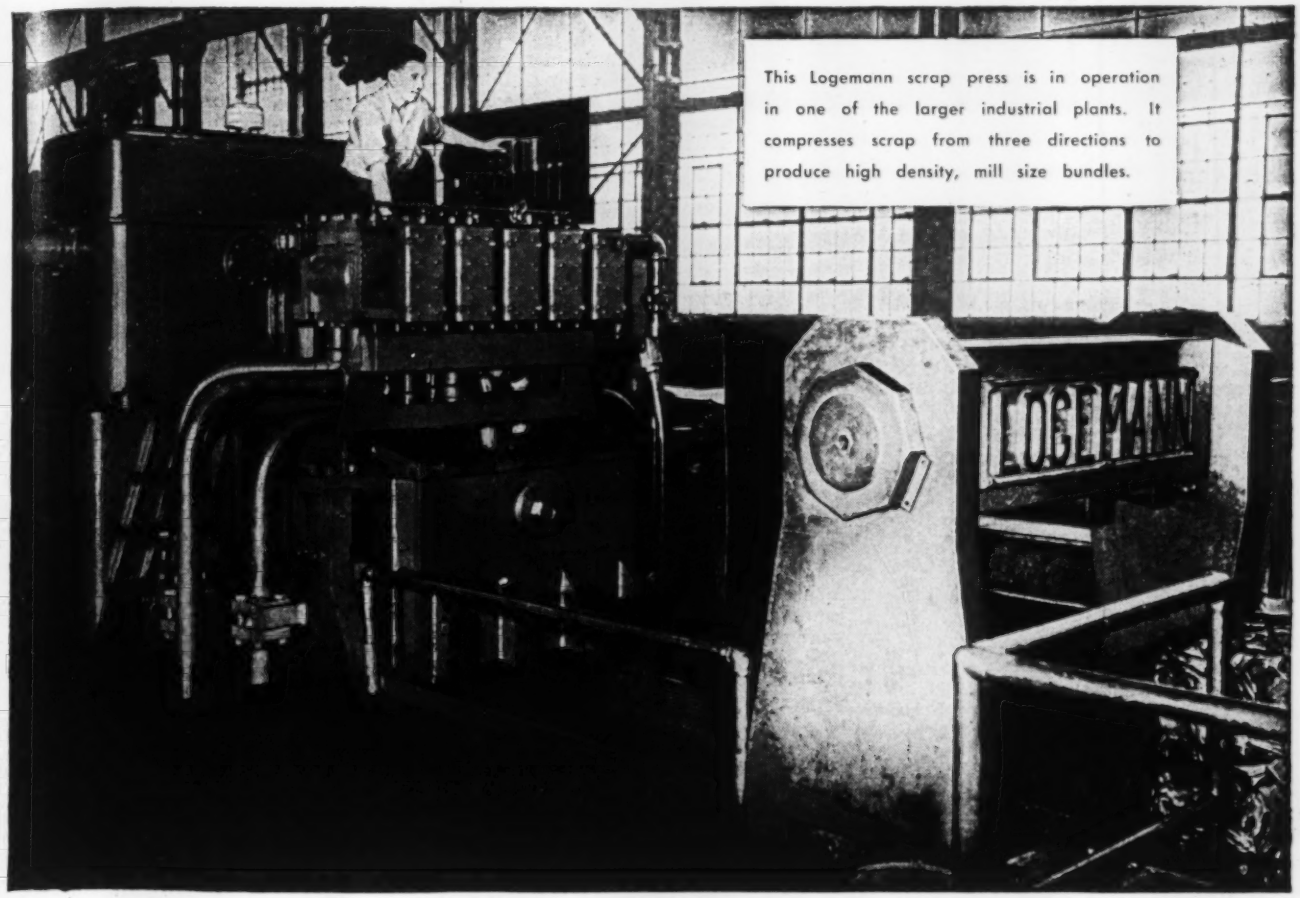
(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades

Cast	40.00-43.00*

* F.o.b. shipping point.



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Triple Compression..
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Sheets, Strip . . .

Sheet and Strip Prices, Page 111 & 112

Cleveland—Mills are under pressure from all directions for flat-rolled products. But they are not scheduling beyond October as yet though most of them have entered orders on books through fourth quarter. Consumers are being held strictly to quotas, and these are subject to revision should military demands necessitate such action.

Sheet sellers are hoping a formal voluntary allocations program is set up quickly since under present conditions they are more or less at sea with respect to the military importance of many inquiries coming to them from consumers alleging the material is required for defense or other government work.

The market is strong pricewise with consumers increasingly willing to pay premiums for conversion and gray market steel. All of the larger producers, however, indicate no upward price revisions are contemplated. On the other hand, several smaller makers of hot-rolled strip have advanced prices $5 per ton over the past several weeks, and several small makers of silicon sheets are reported advancing prices as much as $50 per ton.

Pittsburgh — Nonintegrated sheet and strip producers expect it will become increasingly difficult over coming months to maintain full production schedules due to growing shortage of sheet bars, hot-rolled bands, etc. Some interests are forced to rely to increasing extent on converting steel supplies furnished by customers. Indicated unbalanced demand-supply situation in sheet has revived interest in hand sheet mill operations. Negotiations are under way aimed at returning some of these units to active service.

Integrated producers note an increasing number of inquiries for direct and indirect military needs. September production schedules for civilian goods account are expected to remain largely intact.

Philadelphia—Sheet producers generally have not yet definitely or even tentatively set up allocations for entire fourth quarter on hot and cold sheets. Some have taken no action beyond October, a month that will be blanked out in most cases to handle third quarter arrearages. Most have taken no action beyond November, except possibly in setting up allocations for definite emergency requirements.

The Conshohocken producer increased hot-rolled sheets and strip $3 a ton to 3.60c and 3.50c, mill, respectively.

Chicago—Steel ordering by companies with military contracts continues to inch upward. Sellers are using all possible methods to prevent contractors from using such orders to obtain steel above normal quotas. A favorite device is to approach steel companies, not presently suppliers, and try to book tonnage for the military orders.

The rail strike, which seriously affected the district's ingot production, did not drastically curtail finished steel rolling operations at Carnegie's Gary Sheet & Tin Works. It did, however, interfere with outgoing shipments.

Cincinnati—Sheet mills are moving cautiously compiling fourth quarter schedules because tonnage for military requirements is still undetermined. A four-weeks' carryover in some or all grades already is in prospect.

Birmingham — Consumer pressure continues strong for virtually all specifications in flat rolled steel. Mills are producing every pound possible and can do no more toward filling the overall order backlog.

St. Louis—Army and Navy preference orders continue to nibble sheet production here. Tonnages involved are not heavy, but they have the effect of upsetting delivery schedules.

Plates . . .

Plate Prices, Page 111

New York — Consumers of light gage plates are having increasing difficulty placing new tonnage. In fact, most leading plate makers are out of the market for the remainder of the year on sizes under ½ inch in thickness. Some tonnage is still available for late this year on the heavier thicknesses, but most producers are out of the market on these as well as lighter gages. Alan Wood Steel Co. has advanced prices on plain carbon plates $3 a ton to 3.75c per pound, Conshohocken, Pa. This is the fourth eastern plate mill to have advanced prices on plain material anywhere from $3 to $8 a ton. The leading eastern producer is still holding prices unchanged.

Boston—While at least three different f.o.b. mill prices prevail for plates, little or no effect on distribution is apparent. There is just so much tonnage available and consumers are willing to pay for their share which is under requirements in numerous cases. Plate fabricators have slight success in building inventory and shortage in lighter sizes pinches all shops.

Walsh-Holyoke Boiler Works Inc., Holyoke, Mass., will fabricate 11,000 feet, 36-inch electric welded pipe, installation Lynn, Mass., for Metropolitan District Commission, Boston. Plates will be one-half inch.

Philadelphia—Terrific demand for plates from tank shops continues. Fabricators can't begin to book all the business offered not only because of limited capacities, but primarily because of inability to obtain sufficient steel.

Chemical requirements have picked up appreciably of late. Freight car demands are mounting.

Alan Wood Steel Co., Conshohocken, Pa., resumed operations in its plate department Aug. 21 after suspension of three weeks for repairs and vacations. This producer advanced its price on carbon plates $3 a ton to 3.75c mill. The mill represents the government base on deliveries into Philadelphia. Its rate into Philadelphia is 9 cents not including tax, which is as low as that from the other nearest mill, thus making for a minimum base price of 3.84c, that city. However, on the 3/16-in. thickness it increased its extra $2 a ton, whereas the other nearest mill to Philadelphia did not.

Pittsburgh—September plate allotments for end uses not considered essential from the standpoint of direct or indirect military needs will not be adversely affected to the extent previously feared. Essential requirements scheduled for September rollings are relatively small in relation to total output scheduled by most producers. Freight carbuilders will obtain more tonnage next month.

Chicago—Demands of freight car builders for steel, chiefly plates, have approximately tripled since the addition of 122,000 units was proposed. Builders remain confident their needs will receive precedence when the government institutes an allocation program. One builder last week predicted that capacity production could be reached in January with supply of the necessary steel. A local steelmaker, however, believes the 10,000-car-a-month goal could not conceivably be reached before the end of first quarter.

Birmingham — Plate supply prospects are uncertain. In addition to heavy requirements for defense, which have not yet materialized in great volume, other plate users are asking for more tonnage. Producers are booking new business cautiously in view of the general uncertainty. Production remains at capacity.

Los Angeles—One plate producer, to keep lengthening deliveries in rein, has arbitrarily reduced September quotas. In some instances, new and lower mill quotas allow November shipment on orders placed now.

Seattle — Plates are increasingly scarce, making it difficult for many shops to operate. Tacoma received no bids for an unstated tonnage urgently required for the municipal light plant.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 111

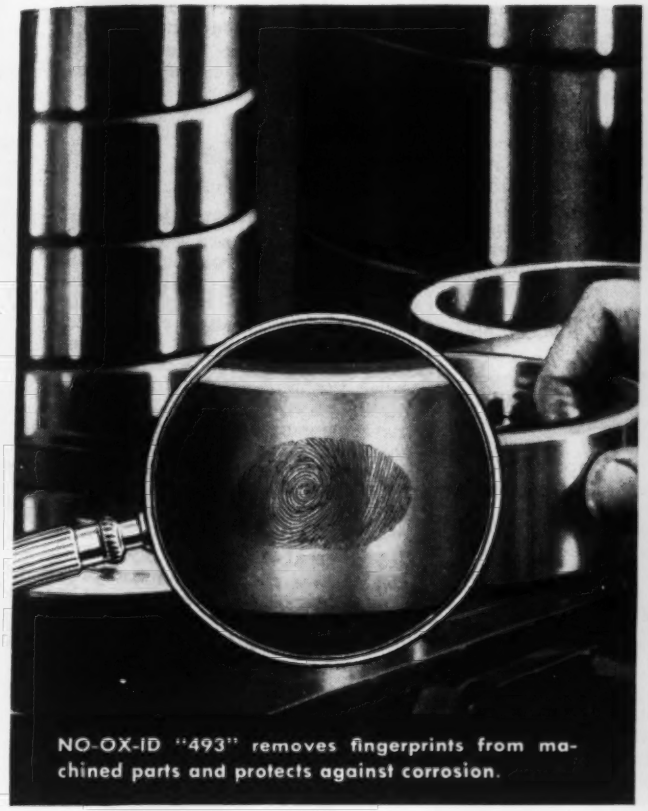
San Francisco—Demand is active for current construction and stockpiling in anticipation of shortages and allocations.

Tin Plate . . .

Tin Plate Prices, Page 112

Pittsburgh—Shipments of tin mill products last week were well sustained despite strike at Pittsburgh & Lake Erie Railroad. In a few instances shipments were delayed but can readily be made up. Output remained practically at capacity. Most sellers' production schedules are fixed for October delivery. Relatively little change in product mix is indicated for closing months this year, although military needs for ration containers, shell container ends, etc., may well upset tentative schedules already established for this period. Mill distribution policy has prevented accumulation of inventories with result that stocks among can companies are not out of line. While stocks are below normal in many instances, no interruption to production schedules is attributed to this cause.

San Francisco — Canmakers and food packers are pinched by the railroad car shortage. Can plants have difficulty getting tin plate from eastern mills. At the same time, shipments of finished cans to packing plants are slow.



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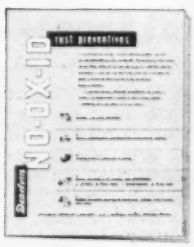

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Steel Bars . . .

Bar Prices, Page 111

New York—Rail labor disputes in the Midwest curtailed bar deliveries here last week. No delay for this reason was experienced at the eastern mills. However, eastern mills were put under greater pressure for tonnage. Bar consumers in virtually all lines are actively trying to place new tonnage but without much success.

Boston—Most carbon bar capacity for fourth quarter is taken. Alloy buying is heavier with armament contracts accounting for most of the increased demand; alloy deliveries extend into November. Screw machine products take substantial volume of smaller sizes.

Philadelphia—Hot carbon bar sellers are already adjusting fourth quarter quotas as an increasing amount of railroad and defense work is making itself felt. Cold drawers have little tonnage to offer against new orders over the remaining months of this year.

Cleveland—Efforts of hot and cold-finished bar buyers to place additional tonnage on mill books are getting them nowhere. The mills are virtually booked up through remainder of the year and are not willing to accept tonnage outside customer allotments.

Los Angeles—Cold-drawers, booked six months ahead on sizes ¼ to 3-in., are getting only 75 per cent of the hot bars they need. Deliveries, even under quota, are steadily lengthening.

Seattle—Demand for merchant bars is up sharply with general construction and military requirements absorbing output. Customers insist on quick delivery.

Structural Shapes . . .

Structural Shape Prices, Page 111

New York—Rush of contractors to place work with fabricators has subsided somewhat. Construction that is fully planned and stands chance of obtaining a priority, in event that steel is allocated, continues to come out. This includes an increasing amount of industrial work, particularly power plant expansion. Some work that is of obviously less essential character and has not progressed too far in the program planning stage is being dropped. Fabricated material prices have stiffened and fabricated material deliveries have become more extended, due in part to scarcity of shapes.

Boston—Fabricated structural steel deliveries are lengthening; held by backlogs some shops cover balance of this year. In view of limited allocations on plain material, some being lower for fourth quarter, shops are more selective in estimating new volume. This has firmed prices somewhat.

Pittsburgh—Sharp increase in inquiries from private sources and to lesser extent for municipal and other public jobs has occurred.

Philadelphia—Fabricated structural steel deliveries have been further sharply extended, some shops no longer making promises before second quarter of next year. Other fabricators are promising five to six months.

Early last week strikers at the Phoenix Iron & Steel Co., Phoenixville, Pa., returned to work after being out for a few days.

Los Angeles—Producers are receiving inquiries for shapes as far east as Chicago, but no tonnage from new customers can be accommodated. District producers are blanking out part of shape mill schedules for fourth quarter to become current. Construction of the Arroyo Seco $6 million freeway bridge in Pasadena will start in January, is scheduled for completion in 1952.

San Francisco—Contractors report there has been no rush to beat higher prices or prospective material shortages.

Seattle—Fabricators report heavy inquiry from military and private sources. Estimators are busy, but some are handicapped in bidding because of uncertainty of steel supplies.

Tubular Goods . . .

Tubular Goods Prices, Page 114

Pittsburgh—Pressure and mechanical tubing production schedules are filled through fourth quarter. Most sellers have reverted to strict mill distribution allotments for first quarter delivery. Tubing requirements for tank treads are increasing and demand for casing and oil well tubing has recorded further gains. Jobbers of standard pipe items contend inventories are unbalanced and below requirements.

Boston — Stocks having been depleted by sustained demand, merchant steel pipe distributors are taking October allocations in full. Utilities also are inquiring for more pipe, some sounding out producers for estimated 1951 requirements

Cleveland—Pipe jobbers are actively pressing the mills for shipments but the latter are holding strictly to allotment schedules. Several construction jobs in this area taking large tonnages of conduit, are exerting pressure for stepped up shipments.

Seattle—Cast iron pipe inquiry is active, but increasing mill congestion, delayed deliveries and price fluctuations are handicapping sales. Deliveries have slowed, now ranging up to 140 days. Prices are on an escalator basis.

Wire . . .

Wire Prices, Page 113

Cleveland—Wire mills are unable to accept additional business from consumers and jobbers for delivery over the next several months. Virtually all the mills are booked to capacity and are declining new commitments. Uncertainty with respect to military requirements serves to engender a high degree of caution among the mills as regards forward commitments.

Birmingham—Capacity production of wire still falls short of demand in this territory. The demand is evenly spread over the entire list, including manufacturers' wire.

San Francisco—Certain types of nails are in short supply and increased military shipping activity has raised demand for wire rope. Cargo of 5000 kegs of nails reached San Francisco from Japan recently.

Stainless Steel . . .

Stainless Steel Prices, Page 114

Pittsburgh — Stainless strip and sheet producers are booked through 1950 and some have accepted tonnage into first quarter. Mill schedules for fourth quarter are subject to substantial revisions pending clarification of government needs for direct and indirect military requirements. Another factor making it difficult to establish accurate order scheduling is growing shortage of nickel with consequent threat to full production schedules. There is good prospect allocation of nickel will be reduced to 50 per cent of normal in closing months this year.

Universal-Cyclops Steel Corp., Bridgeville, Pa., has reduced premium quotations of ½ to 1 cent per pound to competitive levels quoted by other members of the industry, effective Aug. 10.

Waterbury, Conn. — Bristol Co., Mill Supply Division, is offering stainless steel socket set screws and cap screws. The new line of socket screw products are made of 18.8 stainless steel.

Semifinished Steel . . .

Semifinished Prices, Page 111

Pittsburgh—Inadequate sheet bar supply shows no signs of improving and is expected to be a major obstacle in full utilization of marginal hand sheet mills to meet unprecedented sheet demand indicated for months ahead. Some nonintegrated hand mill operators have made extensive commitments with French, Belgian and German sheet bar supply sources at prices comparable with domestic quotations which range between $85 and $100 per ton. Recent advances in scrap quotations are a major reason for abnormally high price levels of semifinished steel items. Rerolling ingots are quoted within range of $68 and $75 at mill; slabs at $85 to $105 and forging billets and blooms at top of $115 per ton.

Cleveland — Steelmaking and blast furnace facilities of Republic Steel Corp. were closed down here last week by the strike of trainmen on the company's River Terminal Railway which serves its local plants. Indications are at least 35,000 tons of ingots will be lost from production before the openhearths are back in operation. Meanwhile, the company has maintained finishing mill operations by drawing upon its stocks of semifinished steel.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 114

New York—Bolt and nut makers' backlogs have jumped sharply over the last several weeks. Some plants that could make prompt delivery on a wide variety of items last June are now booked ahead eight to ten weeks. There are evidences of considerable

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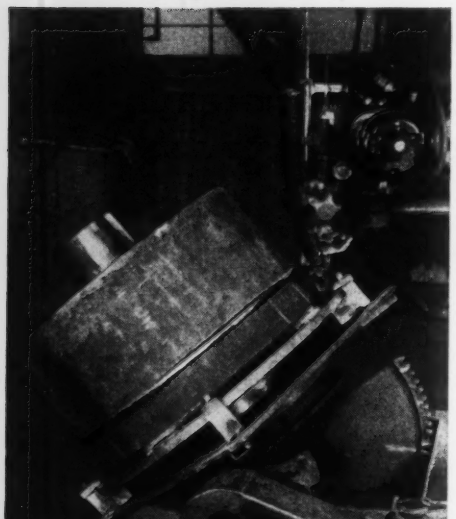

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stockpiling on the part of jobbers, railroads and building contractors. Meanwhile, bolt and nut makers are having difficulty getting steel and some have been forced to reduce their inventories substantially. It is going to be a tough fight for them to even partially maintain existing stocks over the remainder of this year. Bolt and nut prices are unchanged, reflecting the stability in mill prices on bar and wire products.

Warehouse . . .

Warehouse Prices, Page 115

Pittsburgh—Distributors are able to accept only 20 to 25 per cent of firm orders offered due to unbalanced and depleted inventories. With few exceptions orders booked are limited to regular customers.

Cleveland — Local warehouses are turning away a large volume of business that is coming to them from distant points. Consumers, seeking to offset deficits in mill shipments, are flooding the distributors with inquiries. Were the warehousemen to accept all of these orders their stocks, already depleted, would vanish entirely.

Cincinnati—Warehouse business in August held at a good level, but at expense of inventories. Replacement shipments from mills continue disappointing and are absorbed quickly.

Los Angeles — Distributors are struggling to keep stocks even in fair balance. Heavy orders placed with cold-drawers in mid-July have put warehouse stocks of cold-rolled bars in better shape, but stocks of other products continue to sink. Airframe manufacturers in this district, representing one-third of nation's total, are seeking steel inventories to support 4 to 5 months of accelerated production schedules.

Iron Ore . . .

Iron Ore Prices, Page 115

Cleveland—Stocks of Lake Superior iron ore at furnaces and Lake Erie docks amounted to 24,107,874 tons Aug. 1, nearly 11 million tons less than the 35,063,647 tons reported a year previously.

Indications are supplies will be extremely tight next spring before the 1951 shipping season opens. To reduce the prospective deficit, the industry expects to boost all-rail shipments to Ohio and western Pennsylvania furnaces to between 750,000 and 1 million tons for the season.

Consumption of Lake Superior iron ore amounted to 7,579,251 tons in July compared with 7,249,109 tons in June and 5 262,359 tons in July of last year. This brought the cumulative total for 1950 to 47,425,250 tons compared with 48,515,456 tons for the like 1949 period, reports the Lake Superior Iron Ore Association.

On Aug. 1, only nine furnaces were idle, seven in the United States and two in Canada compared with a total of 15 furnaces July 1 and 53 Aug. 1, 1949. The number in blast totaled 176 in the United States and 8 in Canada on Aug. 1, total of 184 against 178 on July 1 and 142 on Aug. 1, 1949.

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STEEL

Pig Iron . . .

Pig Iron Prices, Page 110

Pittsburgh—There is growing evidence scarcity of pig iron will become more acute over coming months. Integrated mills are utilizing a larger portion of available iron capacity for internal use. This situation, coupled with widespread increase in activity among both captive and jobbing foundries, has resulted in shortage of pig iron that is more acute than during war years. Some trade authorities contend only answer lies in formal system of priorities which would eliminate shipments of iron for production of nonessential uses. A number of foundry interests have made substantial commitments for foreign iron to help ease the situation. Bulk of foundries have been forced to sharply increase proportion of cast scrap in melting operations. Sellers are rationing iron output on month-to-month basis.

Iron shipments from lone merchant foundry iron stack here were held up last week by strike on Pittsburgh & Lake Erie Railroad.

Philadelphia—The Swedeland, Pa., producer does not plan to make deliveries of basic in September, due to necessity of suspending operations at its larger stack for repairs. Company plans to produce some basic in the smaller furnace the latter part of September, so as to be able to give its regular customers some tonnage in October.

Customers are turning to foreign suppliers for relief. There is increasing interest in foreign iron. Prices on foreign iron are increasing.

Cleveland—Strike of trainmen on the railroad serving Republic Steel Corp.'s plants here forced a sharp reduction in pig iron production in this district last week. Republic was compelled to bank four blast furnaces. As Republic is one of the leading suppliers of merchant iron in this area, the loss of production will be keenly felt in the market

Buffalo—Although the increase in pig iron demand is widespread, sellers report motor interests are still the big consumers.

Cincinnati—Furnace interests are under heavy pressure to supply merchant iron, possibly on consumers' fears of a winter pinch in supplies. Actual requirements are heavier with improvement in melt most apparent for jobbers and foundries on machine tool work, the latter showing steady gains. A dribble of Texas iron, the haul meaning a premium price, is reported.

Chicago — Carnegie-Illinois Steel Corp. banked 18 blast furnaces as the result of the Elgin, Joliet & Eastern Railway strike last week.

Birmingham—Pig iron demand is at record proportions and is widening the gap between supply. Republic Steel Corp. still has a furnace down, reportedly due to coke shortage.

St. Louis — Pressure continues heavy for forward commitments as well as immediate deliveries. Mill demand is constant, but increase in foundry activity is proving an unexpectedly heavy drain on supplies.

San Francisco—Shipment of 2700 tons of pig iron has been landed at San Francisco from Rotterdam.

Seattle—Domestic pig iron is not figuring prominently in the market currently. But considerable activity is reported in foreign iron. A British ship is reported chartered for September loading of 1500 tons at a Holland port for shipment to Los Angeles and Vancouver, B. C.

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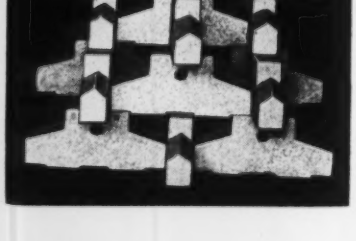

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Rails, Cars . . .

Track Material Prices, Page 113

Birmingham—Southern Pacific has placed an order for an additional 1000 box cars with the Bessemer plant of Pullman-Standard Car Mfg. Co. This makes 3000 cars on order for that line here. Pullman-Standard resumed production Aug. 22 after a strike which started July 12.

Scrap Imports Proceeding

New York—Steel companies expect to receive before end of 1950 all the scrap purchased in Germany this summer.

Part of the scrap already has been shipped, part is enroute and definite charters have been arranged for that portion due in August and September.

Luria To Move New York Office

New York—Luria Bros. & Co., a leading scrap broker, has leased space in the new 36-story air-condi-

tioned office building at 100 Park Ave. It has taken a long term lease of space on the 34th floor for its New York purchasing and sales offices. For many years these have been in the Woolworth Bldg.

Scrap . . .

Scrap Prices, Page 118

Pittsburgh—Major mills are out of the market for open-hearth dealer scrap and have not paid the high prices quoted during the last two weeks. Those interests with large electric furnace capacity have been buying regularly, however, and at or above quoted levels. An increasing tonnage of scrap is moving directly from metalworking companies to their steel suppliers. There appears to be no evidence of a serious shortage in supply of scrap. In addition to unusually large tonnage of customer scrap generated as result of record breaking metalworking operations, an increasing tonnage of foreign scrap is scheduled for shipment here through remainder of this year. U. S. Steel Corp.'s subsidiaries expect receipt of about 150,000 tons of German scrap to mills in Pittsburgh, and an additional 50,000 tons to Pacific coast plants. Sale of short turnings at $37 represents advance of $1.50; crushers are paying up to $35 for machine shop and mixed borings and turnings.

Boston—Price advances in steelmaking scrap are more conservative with No. 1 heavy melting up better than 50 cents a ton. Other grades are steady at recent higher levels.

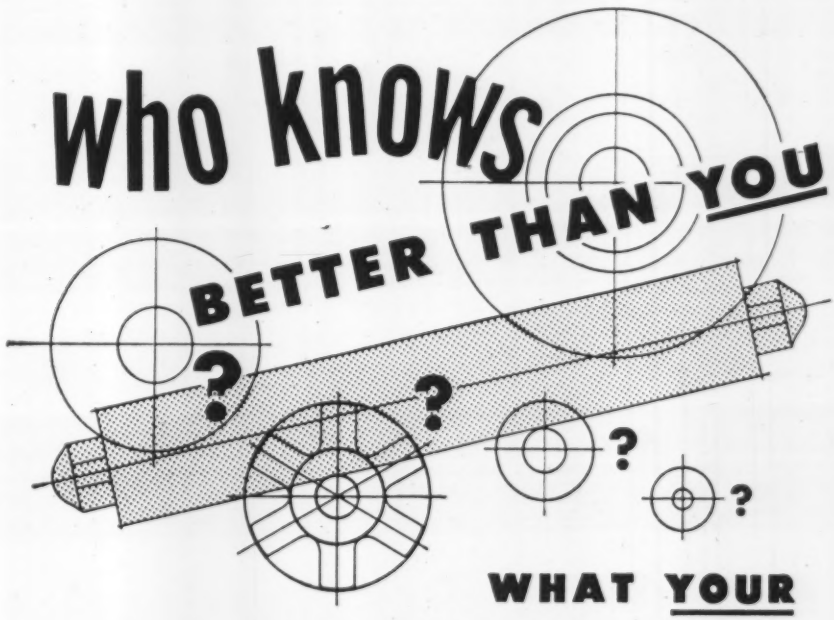
Philadelphia—Scrap prices generally continue to advance. Buying by a Birdsboro, Pa., consumer has shot the market up to $41-$42 on No. 1 heavy melting steel and No. 1 bundles. This consumer apparently is trying to keep just a little ahead of the market at Pittsburgh so as not to lose tonnage out of the local district. No. 2 heavy melting steel, however, has advanced more modestly to $36, delivered, based primarily on what dealers and brokers have to pay in order to make delivered shipments at that level.

New York—Brokers' buying prices are slightly stronger on most grades. Offerings for No. 1 heavy melting and No. 1 bundles are $35-$36, fob shipping point, although the inside figure appears the more generally representative. No. 2 heavy melting steel is $28-$29; No. 1 busheling, $29-$30; No. 2 bundles, $27-$28. Machine shop turnings are $23-$24; mixed borings and turnings, $22-$23, the latter unchanged. Short shovel turnings are slightly higher at $25 and low phos plate scrap and low phos, five foot and under, $36-$37. Electric furnace bundles are unchanged.

Major cast grades are higher. Brokers are offering $30-$31 for No. 1 cupola cast; $32 for No. 1 machinery; $30-$31 for charging box and heavy breakable.

Cleveland—Scrap prices held unchanged here last week as a lull settled over the market pending outcome of the labor dispute in the railroad industry. Activity was confined chiefly to covering by brokers. Scrap is moving in good volume from industrial plants.

Buffalo—Strength rules the scrap



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market, but leading mills refuse to recognize recently-advanced prices and a deadlock prevails. Dealers claim the higher prices are justified by prices in markets elsewhere. Prices on cast scrap jumped an additional $2 a ton last week on a sale of No. 1 cupola within a range of $38.50-$39. Scrap continues to arrive in large quantities from the eastern coast via the canal.

Cincinnati—Scrap prices are higher, reflecting advances elsewhere. One mill re-entered the market to obtain tonnage for nearby needs; other interests, buying next month, likely will recognize the markups. Foundries are buying liberally.

Detroit—Resumption of buying for inventory by steel mills on a broad scale has driven prices upward again, by $1-$4 a ton. One open-hearth plant here which was comfortably fixed on scrap for 30-60 days is stepping up this inventory by an additional 30 days.

Chicago—Oldtimers in the scrap industry are shaking their heads in disbelief over the market's buoyancy. Brokers have raised their buying prices by at least $1.50 on major open-hearth grades, but with no visible mill buying on which to pin the higher prices. A few broker-dealer transactions have occurred at more than $41 for No. 1 heavy melting, although this level has not been reached by the entire trade. New mill buying is expected to be in excess of that figure, however.

Birmingham—Price trend in scrap is still strongly upward with new advances being posted. Heavy melting is up $1 to $33-$34.

St. Louis—Slow shipments to this area are keeping scrap prices strong. Mills are doing almost no buying. Outside pressure for cast grades was responsible for price markups last week in brake shoes, heavy breakable and burnt cast. Big outstate foundries are buying anything in sight. Industrial scrap is not coming out in normal quantities.

Los Angeles—Scrap prices are unchanged, but market undertone is strong. Mills need much more scrap to support capacity operations than dealers are supplying and prices of steelmaking grades are buoyant.

San Francisco—Mills are keeping stockpiles replenished and inventories remain large. Prices are holding below levels prevailing in other West Coast steelmaking areas.

Seattle — Conditions in the steel scrap market are confused. The increase of $4, effective Aug. 2, stimulated shipments, but dealers are holding back in expectation of a further advance. The atmosphere is speculative. Buyers for the larger interests had hoped the recent increase would result in larger receipts.

Cast scrap is not plentiful at $30 to $35, but foundry supplies are sufficient for current operations. Foreign pig iron is being generally used by local plants.

Water Supply Adequate

Youngstown — District steel mill operations this year are not hampered by water shortage. Storage here is adequate currently, the three main reservoirs being half full and the flow in the Mahoning river holding well above the minimum of 200 million gallons daily. Last year the river's flow fell to about 125 million gallons at times.

Fabricators Need Steel

Youngstown—Although this is one of the larger steel producing centers, consumers in this area are having a rough time obtaining supplies of the various products. One local fabricator could employ 1000 to 1500 more workmen if it could get all the steel it needs.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, 21-story Melrose Bldg., Houston, to Mosher Steel Co., Houston; Tellepson Construction Co., Houston, general contractor.

1000 tons, warehouse and office, Penn Fruit Co., Philadelphia, to Bethlehem Steel Co.

900 tons, field house, gymnasium, Vanderbilt University, Nashville, Tenn., to Nashville Bridge Co., Nashville; Foster & Creighton Co., Nashville, general contractor.

760 tons, bar joists, regional trading center, National Suburban Centers Inc., Framingham, Mass., to Bethlehem Steel Co.; George B. H. Macomber Co., Boston, general contractor; 1000 tons, fabricated structural steel awarded A. O. Wilson Structural Co., Cambridge, reported STEEL, July 31.

525 tons, apartment house, Yellowstone boule-

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yard, Forest Hills, N. Y., to Grand Iron Works Inc., Bronx, N. Y.

400 tons, Junior-Senior High School, Clarence, N. Y., to Ernst Construction Co., Buffalo; W. F. Hendrich Co., Inc., Buffalo, general contractor.

180 tons, Seattle light department substation, to Bethlehem Pacific Coast Steel Corp., Seattle.

152 tons, church and school building, St. Benedict's, Eggertsville, N. Y., to Buffalo Structural Steel Co., Buffalo; Balling Bros., Tonawanda, N. Y., general contractor.

68 tons, railroad underpass, Malta, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle; general contract to Roy L. Bainr Co., Spokane, low, $257,505.

Unstated, nine double drum winches for government agency, to Skagit Steel & Iron Works, Sedro-Woolley, Wash., low $142,798.

Unstated, Army self-propelling gun mounts, to Pacific Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

6000 tons, estimated, second unit, Alfred E. Smith housing development, New York; bids asked.

3100 tons, Safeway Stores, Landover, Md.; bids to be closed by Turner Construction Co., Philadelphia, Aug. 29.

2750 tons, No. 13, New Jersey turnpike, Newark; bids Sept. 8.

1500 tons, Gansevoort Destructor plant, Department of Public Works, New York; bids Sept. 19.

1250 tons, Andrus Home for the Aged, Hastings-on-Hudson, N. Y.; bids in.

1250 tons, municipal connecting highway, Queens, N. Y.; bids Aug. 29.

1000 tons, Tuberculosis Hospital, Department of Public Works, Bronx, N. Y.; bids Sept. 13.

800 tons, state bridges, Danvers-Middleton-Topsfield, Boxford, Mass.; Savin Construction Co., Hartford, Conn., general contractor; 305 tons, reinforcing bars, also required.

600 tons, state bridge, Schuylkill county, Pennsylvania; F. D. Kessler, Northumberland, Pa., low on general contract.

558 tons, state bridge, Indiana county, Pennsylvania; bids Sept. 8.

550 tons, state bridge works, Berks county, Pennsylvania; bids Sept. 14.

435 tons, tunnel supports, etc., Faber dam, Marias river, Montana; Western Contracting Corp. and Massman Construction Co., Sioux City, Iowa, low joint bidders, $11,564,347.

225 tons, three rolled beam bridges and approaches, Glastonbury, Conn.; bids in Oct. 28, Hartford, Conn.

200 tons, Bureau of Roads bridge in Oregon; bids in at Portland, Aug. 22.

200 tons, relocation Seattle, Portland & Spokane Railway; several bridges; bids in at Portland, Oreg., Aug. 21.

120 tons, single span rolled beam bridge, Darien, Conn.; bids in Aug. 28; contract also includes 80 tons, reinforcing bars.

100 tons, state bridge, Allegheny county, Pennsylvania; bids Sept. 8.

75 tons, North gate theater, Seattle; W. G. Clark Co., Seattle, low $258,402.

Unstated, miscellaneous steel Coulee dam; bids for spec. No. 3125 rejected; new bids called, No. 3157.

Unstated, two radial gates, two hoists, Potholes East canal headworks, Columbia Basin project; bids to Bureau of Reclamation, Denver Sept. 14.

Unstated, steam plant reactor station; bids to Atomic Energy Commission, Idaho Falls, Idaho, Aug. 28.

REINFORCING BARS . . .

REINFORCING BARS PLACED

800 tons, regional trading center, National Suburban Centers Inc., Framingham, Mass., to Concrete Steel Co., Boston; George B. H. Macomber Co., Boston, general contractor.

600 tons, Student Union buildings, Pullman, Wash., to Bethlehem Pacific Coast Steel

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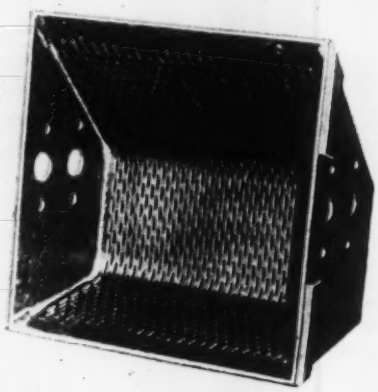
Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write us in detail regarding any metal product you desire fabricated.

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mlleo Open Steel Flooring,
"Shur-Site" Treads and Armorgrids

Here's Efficient Welding

On C-F Positioners

When heavy, unwieldy weldments like these diesel crank cases can be quickly swung into any position so that every weld is made downhand—that's efficient welding!

Weldors spend more time welding—do better welding at lower cost when they work with C-F Positioners because these hand and/or power operated machines reduce positioning time to a minimum. Investigate the cost-saving advantages of C-F Positioners. They pay their way in any company.

Write for Bulletin WP24—an illustrated circular detailing the specific advantages of C-F Positioners.

CULLEN-FRIESTEDT CO.

1308 S. Kilborn Ave., Chicago 23, Ill.

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

C-F positioned welds mean better, more economical welds

Corp., Seattle; Henry George & Sons, Spokane, general contract.

278 tons, East Canal, Columbia Basin project, to Bethlehem Pacific Coast Steel Corp., Seattle; J. A. Terteling & Sons, Boise, general contractors.

200 tons, 21-story Melrose Bldg., Houston to Mosher Steel Co., Houston; Tellepson Construction Co., Houston, general contractor.

200 tons, field house, gymnasium, Vanderbilt University, Nashville, Tenn., to Wilson-Weesner-Wilkinson Co., Nashville; Foster & Creighton Co., Nashville, general contractor.

130 tons, military installation Alaska, to Northwest Steel Rolling Mills Inc., Seattle.

100 tons, state highway bridges, Adams, Mass., to Truscon Steel Co., Boston; Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

100 tons, two bank structures, Seattle, to Northwest Steel Rolling Mills Inc., Seattle.

100 tons, Lutheran hospital, Puyallup, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

100 tons, construction at Spokane, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

3200 tons, main unit Chief Joseph dam, Washington state; bids to U. S. Engineer, Seattle, about Nov. 1.

2800 tons, Faber dam, Marias river, Montana, bids in to Bureau of Reclamation, Denver.

275 tons, also 25 tons shapes, Duval bridge, King county, Washington; State Construction Co., Seattle, awarded at $352,942.

214 tons, state bridge, Indiana county, Pennsylvania; bids Sept. 8.

200 tons, Seattle juvenile detention station; bids Aug. 28.

135 tons, three bridges and approaches, Glastonbury, Conn., bids in Aug. 28, Hartford, Conn.

Unstated, terminal, Consolidated Freightways, Walla Walla, Wash.; general contract to L. S. Wynans, Portland, Oreg., $125,000.

Unstated, refrigerator building Eastern Oregon State Hospital, Pendleton; bids to Salem, Aug. 28.

PLATES . . .

PLATES PLACED

500 tons, water supply line, Medford, Oreg., to Consolidated Western Steel Corp., Los Angeles, $890,854.

100 tons, Union Oil Co., asphalt plant, near Seattle, to Consolidated Western Steel Corp., Los Angeles; Bechtel Corp., Seattle, general contractor.

PLATES PENDING

100 tons, elevated water tank; bids in to Florence, Oreg., Aug. 21.

Unstated, welded tanks and miscellaneous, South substation; bids to Seattle light department, Aug. 30.

Unstated, two 150,000-gal. elevated storage tanks; bids in to Atomic Energy Commission, Idaho Falls, Idaho, Aug. 17; bids Aug. 25 for four smaller units.

PIPE . . .

CAST IRON PIPE PLACED

300 tons, system supplies, Pasco, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

195 tons, 37th avenue, N.E. extension, Seattle, to E. N. Hallgren, Seattle, for American Cast Iron Pipe Co., Birmingham.

134 tons, Vaughan, Oreg., for Viking Automatic Sprinkler Co., to E. N. Hallgren, Seattle, for American Cast Iron Pipe Co., Birmingham.

100 tons, Kent, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

100 tons, Central, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

CAST IRON PIPE PENDING

350 tons or more, system extensions, Spokane, Wash.; bids in.

200 tons, Shelton, Wash., system extension; bids in.

125 tons, King county, Washington, district No. 7; bids in.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Union Pacific, three 1600-hp all-purpose diesel-electric locomotives, to Fairbanks, Morse & Co., Chicago.

LOCOMOTIVES PENDING

Chicago, Rock Island & Pacific, eight 4500-hp diesel-electric freight locomotives and six 2250-hp diesel passenger locomotives; purchase authorized.

Erie, 57 diesel units; purchase authorized.

Southern Pacific, 46 diesel-electric locomotives; purchase authorized.

RAILROAD CARS PLACED

Baltimore & Ohio, two rail diesel cars, to Budd Co., Philadelphia.

Chicago & Eastern Illinois, 500 box cars, 200 each to Pullman-Standard Car Mfg. Co., Chicago, and American Car & Foundry Co., New York, and 100 to the company's own shops at Danville, Ill.

Delaware, Lackawanna & Western, 500 seventy-ton drop-end gondolas, to American Car & Foundry Co., New York.

Detroit, Toledo & Shore Lines Railroad, 100 seventy-ton covered hoppers to Greenville Steel Car Co., Greenville, Pa.

Erie, 105 flat cars, to its Dunmore, Pa., shops; five will be heavy-duty depressed-center type cars, the remainder will have 70 tons capacity.

Louisville Nashville, 1000 fifty-ton box to Pullman-Standard Car Mfg. Co., Chicago.

Montour Railroad, 300 fifty-ton twin hoppers to Greenville Steel Car Co., Greenville, Pa.

Reading, 500 seventy-ton gondolas, to Bethlehem Steel Co.

Western Fruit Express Co., 400 steel refrigerator cars, to own shops.

RAILROAD CARS PENDING

Chicago Rock Island & Pacific, 1350 freight cars, purchase authorized; list comprises 500 flat cars, 500 gondolas and 350 box cars.

Chicago Transit Authority, 200 to 350 trolley coaches; reported contemplated.

Southern Pacific, 5000 freight cars, 1000 to Pullman-Standard Car Mfg. Co.'s Bessemer, Ala., plant and balance to be either purchased from outside shops or built in the company's own shops.

FERROALLOYS

(*Continued from Page* 115)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34.41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract carload, 1" x D; packed, max 0.50% C grade, $1.03 per lb of contained chromium.

Do YOUR Doors Give You These KINNEAR Values ?

High Efficiency! Doors coil overhead, clear the entire opening.

Extra Space! All floor, wall, and ceiling space is always fully usable.

Convenience! Smooth, easy, upward action saves time and labor.

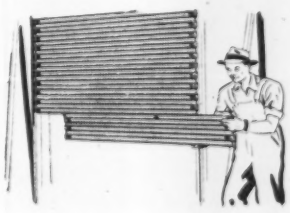
Safe from Damage. Open out of the way, safe from wind or vehicles!

Extra Protection. All-metal curtain repels fire, theft, and wind.

Extra Durability. Strong resilient curtain withstands more punishment.

Longer-lasting! Many doors in steady service 40 years or more.

Low-Cost Repairs. Slats individually replaced if damaged.



Any Size! Each door built to meet individual requirements.

Kinnear Rolling Doors are easily equipped with Kinnear Motor Operators for highest convenience and efficiency. Pushbutton controls can be provided at any number of convenient points — a feature that not only saves manpower but also reduces heating and air-conditioning costs by encouraging prompt door closure. Every door is specially fitted to the individual opening. Easily installed in new or old buildings. Write for details and estimate on your door requirements.

THE KINNEAR MANUFACTURING CO.

Factories:
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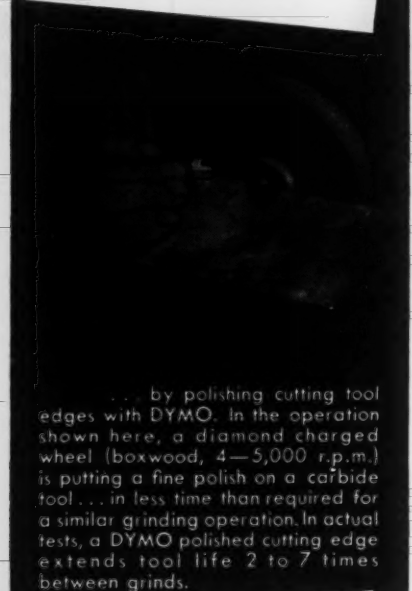
Offices and Agents in All Principal Cities

Saving Ways in Doorways
KINNEAR
ROLLING DOORS

YOU CAN DOUBLE CUTTING TOOL LIFE!



. . . by polishing cutting tool edges with DYMO. In the operation shown here, a diamond charged wheel (boxwood, 4—5,000 r.p.m.) is putting a fine polish on a carbide tool . . . in less time than required for a similar grinding operation. In actual tests, a DYMO polished cutting edge extends tool life 2 to 7 times between grinds.

ELGIN DYMO
DIAMOND COMPOUND

Elgin Dymo works faster and goes farther because precision graded particles of pure diamond, assisted by an exclusive Elgin vehicle, do the cutting. Elgin Dymo excels in actual shop convenience, too! It comes ready to use, each grade distinctly colored for instant identification, and it is universally soluble to simplify clean-up after polishing.

See how Elgin Dymo . . . available in 11 Bureau of Standards grades for any lapping or polishing job . . . will reduce your finishing costs and give you better results at the same time. Just mail coupon below for a free demonstration right in your own plant!

---MAIL THIS COUPON TODAY---

Yes, I'd like to see how DYMO can help extend cutting tool life.

NAME_____

POSITION_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

INDUSTRIAL PRODUCTS DIVISION
ELGIN NATIONAL WATCH CO.
ELGIN, ILLINOIS

ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.65c per lb of alloy, ton lots packed 9.05c, 200 to 1999 lb 9.40c, smaller lots 9.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained, F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primes and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c per lb; No. 6, 63c; No. 79, 45c, freight allowed.
Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

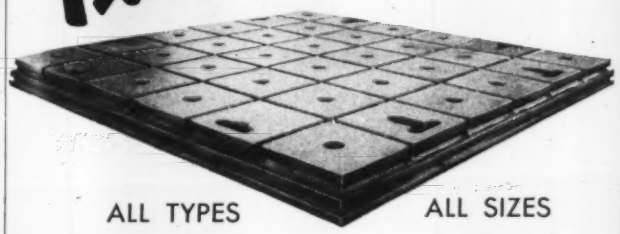
Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.
Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.
Bortam: (B 1.5-1.9%). Ton lots, 45c per lb, smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., frt allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.
Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min. C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.
CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%; Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.
Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.
SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed. ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered. Spot, add 0.25c.
Graphidox No. 4: (Si 48-52%, Ca. 5-7%, Ti 9-11%). C.l. packed, 17.0c per lb of alloy; ton lots 18.0c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.
Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.
Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.
Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.13.
Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

Hyde Park FLOOR PLATES



ALL TYPES ALL SIZES

Floor Plates, Surface Plates and Layout Tables made to specifications.

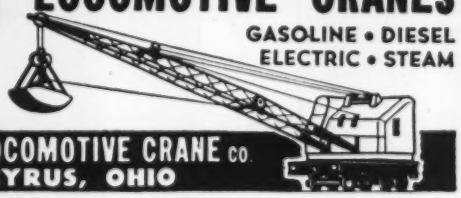
CHILLED and ALLOY IRON ROLLS
ROLLING MILL MACHINERY
GRAY IRON CASTINGS
(Up to 80,000 pounds)

Inquiries invited.

HYDE PARK FOUNDRY & MACHINE CO.
HYDE PARK, PA. **(PITTSBURGH DISTRICT)**

Certified Steel Abrasives
FOR USE IN BLAST CLEANING EQUIPMENT
SAMSON STEEL SHOT
ANGULAR STEEL GRIT
PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASS.

OHIO LOCOMOTIVE CRANES
GASOLINE • DIESEL
ELECTRIC • STEAM
25 TO 40 TON CAPACITY



THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

SAVE MONEY
ON PRESSED STEEL PARTS!

If you want to save money on pressed steel parts, call on Budd's wide experience in steel stampings of all kinds.

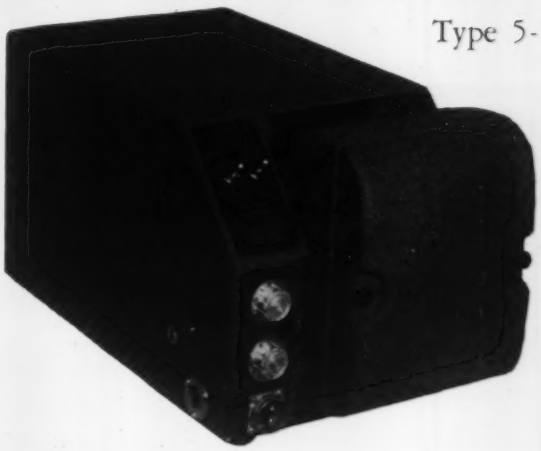
Like hundreds of manufacturers, you can take advantage of Budd "know-how" to lower production costs on blanks and stampings, in both regular grade and stainless steel. At your service Budd places the best-equipped machine shop—for both large and small dies—on the Atlantic seaboard.

Write today, sending a sample, blueprint or pencil sketch of your product, and let us quote you a price.

BUDD
THE BUDD COMPANY
Dept. 16 **Philadelphia 32, Pa.**

CONSOLIDATED'S
NEW *Recording*
OSCILLOGRAPH
Type 5-116

- LOW COST
- HIGH QUALITY
- COMPACT DESIGN



- Choice of 9- or 14-trace capacity
- 10 quick-change record speeds (¼" to 100" per sec.)
- Easily detachable record magazine (capacity 125 ft. of 5" paper)
- Uses standard Consolidated Series 7-200 Galvanometers
- Automatic record numbering
- Two static reference traces
- Record footage indicator
- Precision timing system (.01- and .10-sec. timing lines)
- Constant-temperature galvanometer block
- Simultaneous viewing and recording
- Choice of a-c (115 v, 60 cycle) or d-c (24-28 v) models
- Compact design (dimensions: 9" x 9½" x 19½", weight: 48½ lbs.)
- 4-point shockmount base (optional)
- Trace identification (optional)

Designed to meet the needs of those who require the utmost in performance, but who must operate on a limited budget, the new Consolidated Recording Oscillograph, Type 5-116, is engineered to the precise standards of the larger Consolidated Oscillographs—yet is drastically lower in price.

Using the widely accepted Consolidated Series 7-200 Galvanometers—which offer a sensitivity and frequency for every job—the 5-116 Oscillograph produces records possessing quality and accuracy equal to those of the finest instruments heretofore available.

Compare the 5-116 with any oscillograph now available. Regardless of the size of your budget, you can't find a better value. For further information write for Bulletin CEC-1521-X6

CEC
CONSOLIDATED ENGINEERING CORPORATION
Analytical Instruments for Science and Industry
620 NORTH LAKE AVENUE, PASADENA 4, CALIFORNIA

Metalworking Briefs

CONSTRUCTION, ORGANIZATIONAL ENTERPRISE CHANGES

California

Western Insulated Wire Co. is now in operation at its new location, 2425 E. 30th St., Los Angeles 58. The $500,000 factory will be devoted to manufacture of Neoprene and rubber-jacketed portable cords and cables, asbestos insulated wire and cables, and miscellaneous cords, fixture and communication wires and cables.

California

Kaiser Aluminum & Chemical Corp., Oakland, Calif., is installing a second kiln at its Moss Landing, Calif., chemical plant. The kiln will process dolomite for use in the company's nearby refractory plant.

California

Pacific Guano Co., Berkeley, Calif., started construction of a $150,000 sulphur grinding plant in that city. Its output will be used in the company's insecticides and fertilizers.

California

Pacific Gas & Electric Co., San Francisco, plans to add three 100,000 kw steam-electric generating units to its system at a cost of around $50 million. The new units will be put in operation during 1952 and 1953.

California

Contracts were awarded for construction of additions to Buick-Oldsmobile-Pontiac assembly plant in South Gate, Calif. **Lindgren & Swinerton Inc.,** Los Angeles, is the general contractor at $1.5 million; **Bethlehem Pacific Coast Steel Corp.** received the contract for steel. Other contracts went to Newbery Electric Corp., Lohman Bros., Howe Bros., Grinnell Co. of the Pacific, Coast Paving Co., all of Los Angeles.

California

Hagan Corp., Pittsburgh, combustion and chemical engineering firm, and its subsidiaries, Calgon Inc., Hall Laboratories Inc. and Buromin Co., established a new Los Angeles district office at 3931 Tweedy Blvd., South Gate, Calif.

California

Ray Oil Burner Co., San Francisco, opened a branch office in the Mason Bldg., Fresno, Calif., to be known as the Ray Burner Sales & Service Co. A full line of oil burners for all types of industrial and home furnaces will be stocked.

Delaware

Whitney Metals Corp.—steel—was chartered by the corporation department of the secretary of state's office at Dover, Del. Capital of the firm is listed at $12,000. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Delaware

Accurate-Bend Process Co. Inc.—pipe and tubing—filed a charter of incorporation with the corporation department of the secretary of state's office, Dover, Del. Capital Trust Co., Dover, is serving as the principal office.

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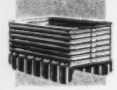

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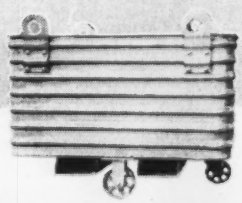

Roll over caster box designed and built by Powell has floor mobility plus stacking and fork truck dumping features.

Illinois

Bastian-Blessing Co., Chicago, is constructing two one-story additions to its plant at 4201 W. Peterson Ave., that city.

Illinois

Nickel Cadmium Battery Corp., New York, appointed Valley Bearing & Equipment Co., Chicago, as sales representative for storage batteries for diesel railway locomotive starting.

Maryland

National Enameling & Stamping Co. Inc., 1901 Light St., Baltimore, manufacturer of enameled ware, etc., has changed its name to Nesco Inc.

Maryland

Randall Corp., Baltimore, aluminum stampings, has moved from 4006 E. Monument St. to Knecht avenue and Pistorio road.

Maryland

E. W. Schultz & Sons, 1246 St. Matthew St., Baltimore, sheet metal work,has purchased a plant and some of the equipment at 1700 Friendship St., and has leased the building to the Sheet Metal Fabricators Inc. The owner plans to use this space to enlarge his own operation eventually, but has set no definite date for this expansion.

Massachusetts

Warren Steam Pump Co. Inc. of Warren, Mass., acquired the Quimby Pump Division of H. K. Porter Co. Inc., Pittsburgh. Operations of Quimby will be moved from Pittsburgh to the Warren plant. The Quimby Co. was formed before the turn of the century and formerly operated plants in Newark and New Brunswick, N. J.

Michigan

Electro Metallurgical Division, Union Carbide & Carbon Corp., New York, will build a plant for production of electrolytic chromium at Sault Ste. Marie, Mich. It is scheduled to be in operation next spring and will adjoin the company's extensive facilities there for the production of calcium carbide.

Missouri

Pittsburgh Plate Glass Co., Pittsburgh, will construct a $300,000 building at 12th street and Burlington avenue, Kansas City, Mo.

Mississippi

Transcontinental Pipeline Co. will construct a gas compressor station in Tylertown, Miss., at an estimated cost of $2 million.

New York

G & R Machinery Co. Inc., Buffalo, is offering for sale or lease a foundry located on Northland avenue, that city. The company recently purchased the property from the government. It was operated by Otis Elevator Co., New York, during World War II.

New York

Oak Ridge Products Mfg. Division, Video Television Inc., moved its offices, showroom and manufacturing plant to newly equipped and modernized quarters at 37-01 Vernon Blvd., Long Island City 1, N. Y.

Ohio

Brainard Rivet Co., Warren, O., purchased the plant of the A. H. Stringer Co., Girard, O., and will move operations to the plant to increase production of steel rivets. Brainard sold its Ivanhoe road property in Warren to Van Huffel Tube Corp. which plans to use the plant for future expansion. The Stringer company is discontinu-

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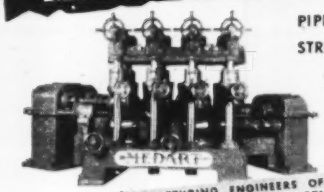

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